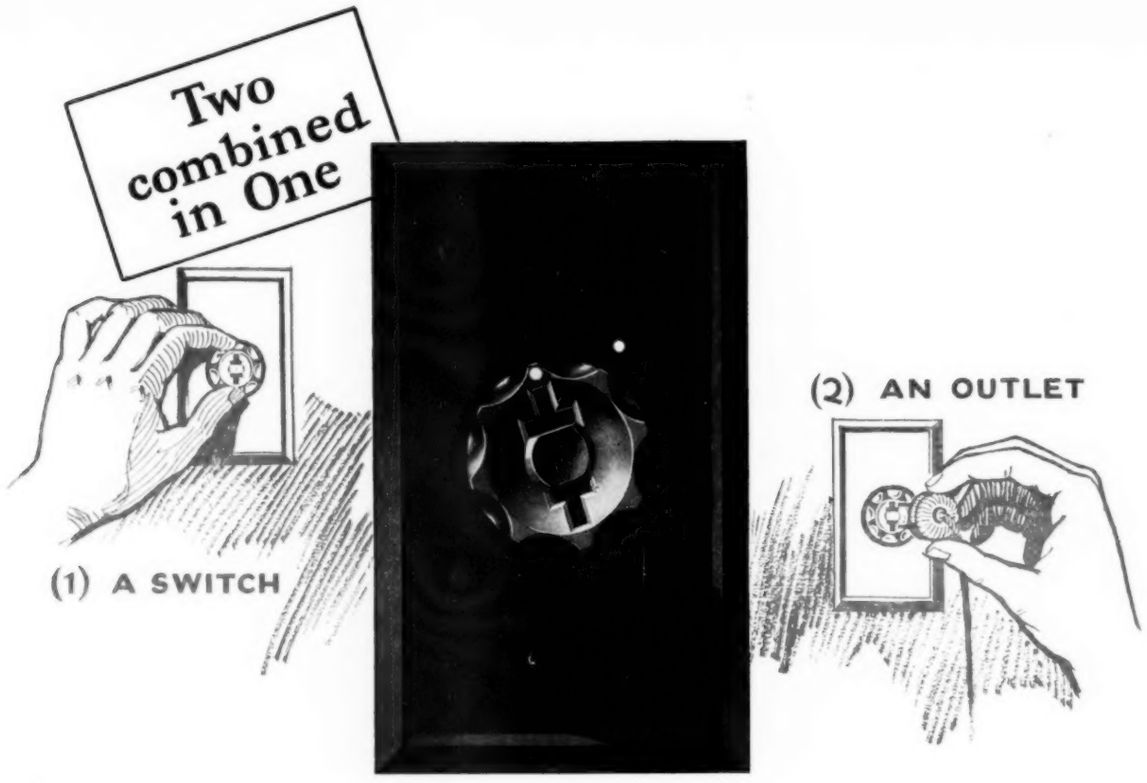
The Electragist

TRADE MARK REG. U.S. PAT. OFFICE

Vol. 27, No. 6 — Association of Electragists INTERNATIONAL — APRIL, 1928



An Improved Switch and Outlet

especially suited for bathrooms, breakfast nooks, beauty parlors, dentists' laboratories, offices and many other places

A SWITCH and T-slot outlet—two units in one! The face of the outlet is raised and grooved to provide a grip for the fingers. It serves as a switch and outlet combined!

A quarter turn to the right—and the switch is on. A quarter turn to the left—and the switch is off.

The "Switch-Tap" may be wired so that the T-slots are always alive—the switch controlling the lights only. Or it may be wired so that the switch can be used exclusively for the purpose of controlling the outlet.

With a Hubbell "Switch-Tap" in the bathroom, the lights can be controlled without disturbing the curling iron or vibrator.

A "Switch-Tap" in the breakfast nook provides an independent switch for the lights and a conveniently located outlet for toaster, percolator and waffle iron.

In fact, wherever a switch control for ceiling or wall lights and electrical service from a convenience outlet are required, the "Switch-Tap" is particularly adapted for use. Plates are furnished in Bakelite, in any color desired, or brass.

Mail the coupon now for literature completely describing this new and useful Hubbell Device. It is sure to suggest many other places where you can use the "Switch-Tap" to advantage.

HARVEY HUBBELL, INC.
BRIDGEPORT, CONN., U. S. A.

HUBBELL **ACORN SWITCH-TAPS**

Mail coupon to our nearest office
Bridgeport, Conn., Main Office

Boston, Mass.
176 Federal St.

Atlanta, Georgia
138 Marietta St.
H. C. Biglin

Pittsburgh, Pa.
State Theatre Bldg.

New York City, N. Y.
30 East 42nd St.

Chicago, Illinois
318 W. Washington St.

Denver, Colo.
1109 Broadway
The Sales Service Co.

Philadelphia, Pa.
5th Avenue—
Philadelphia Bourse
(Exhibition Dept.)

San Francisco, Cal.
390 Fourth St.
Garnett Young & Co.

Send complete information on Hubbell "Switch-Taps"

Name .....

Address .....

E-8-4-28

City and State.....

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The Electragist

(The National Electrical Contractor and The Electrical Contractor-Dealer)

Official Journal of the
Association of Electragists—International

Vol. 27 APRIL, 1928 No. 6

Stop Bid Peddling!

BID peddling by general contractors can be eliminated by establishing on a firm basis the principle of direct letting of contracts. That is the conclusion reached by the Association of Electragists, International, which, through its manager, Laurence W. Davis, is aiding local associations to fight sub-contracting.

Bid peddling became so serious in Spokane, Wash., recently, that electragists of that city called upon national headquarters to help them in their campaign to encourage architects to let contracts direct. "After Spokane electrical contractors had spent their time figuring on jobs, general contractors would peddle the lowest bid to a cut rater and finally double cross the latter, too." Those are the words of one of the leading electrical men in Spokane, who knows the situation.

Mr. Davis, taking up the cudgels for the Spokane electragists, wrote all the architects in that section, urging them to abide by the principles of the American Institute of Architects.

The letter, which may be of use to electragists all over the country who want to call this subject to the attention of their own architects, follows:

"We desire to call your attention to the importance of a general adoption of the practice of direct letting of contracts for mechanical equipment, more especially electrical equipment, in all contracts for building. You are doubtless familiar with the resolution adopted by the American Institute of Architects which reads as follows:

"Resolved, That the American Institute of Architects, in convention assembled, recommends to the members of our profession the adoption of the practice of the direct letting of contracts for mechanical equipment, such as heating apparatus, plumbing and electrical equipment. This recommendation is based on the conviction that direct letting of contracts, as compared with sub-letting through general contractors, affords the architect more certain selection of competent contractors and more efficient control of execution of work, and thereby insures a higher standard of work, and, at the same time, serves more equitably the financial interest of both owner and contractor.

"This practice has become so well established that certain states, that is, New York, New Jersey, Pennsylvania, and Ohio, now require that for public work, such as plumbing, heating, ventilations, electrical work, all bids shall be received separately and contracts awarded to the lowest responsible bidder for each branch.

"The Joint Advisory Committee of the Boston Society of Architects and the Master Builders Association reported to their organizations as follows:

"We are of the opinion that it is both feasible and desirable in most cases to separate the contracts for the mechanical equipment of buildings from the general contract, and to let them separately, and that it may often be desirable to separate some of the other subcontracts as well.

"The arguments of the general contractors, who are, of course, desirous of obtaining a blanket contract covering all the mechanical trades as well as the general work, in order that they may obtain their percentages upon the gross contract, are based upon the theory of ideal practice in which the competency of the general contractor would make possible some service in assuming charge of all operations on the building. But actual experience has proven that such competency is rare. There are only a few general contractors in the country who perform a service in handling such contracts. The grievance is against a large number of those who do not and cannot perform any service, though under the system they are paid a percentage of the cost of all mechanical trades.

"This burden upon the cost of building is still further increased by the common practice of general contractors, who, after securing jobs on bona fide bids of sub-contractors, then turn around and "shop" the bids to irresponsible sub-contractors at lower prices, thus giving to the general contractor this difference in price as an added profit.

"Mr. Sullivan W. Jones, State Architect of New York, in commenting upon this condition wrote:

"These 'deals' between general and subcontractors are in reality trades in which the owner's interests are sacrificed.

"Mr. Jones points out how this condition has been overcome under the laws of the State of New York requiring segregation of subcontracts in the mechanical trades when he says,

"When the mechanical trades are segregated there is a better opportunity for the owner to buy service. In the State work we get a better class of contractor, more responsible contractors, and contractors who are prone to be interested in winning a reputation as well as profits, when we segregate the mechanical trades.

"Electrical work, much of which is concealed in the finished job, is an exceedingly important part of the building equipment and requires engineering skill and knowledge to properly install. Experience has shown that when the electrical work is installed under separate contract, by contractors who specialize in the class of work under consideration, the most efficient and economical maintenance and operation of the building is assured. From the standpoint of the architect, the owner or occupant of the building, we are convinced that the general adoption of the practice of the direct letting of contracts for electrical work is essential."

Well-Rounded Advertising Policy Increases Motor Business

THE Pacific Electric Motor Company, Oakland, California, has a successful complete advertising policy which includes a house organ, sales letters, circulars, folders, blotters, newspaper advertising, publicity in the local papers, and directory space. The manager, who ought to know what effect the advertising expenditure has on his sales, states:

"It is difficult in this line of business to check direct results from advertising. It is a noticeable fact, however, that in the midst of considerable complaint over slow business conditions, the Pacific Electric Motor Company has maintained a good volume and is growing steadily. Credit for all of this may not be due the advertising, but it is the policy of the company to take advertising with a certain amount of faith and to put back into it consistently a part of the proceeds of the business. So far, advertising and good business have gone along hand in hand, and as long as that continues, they will not be separated."

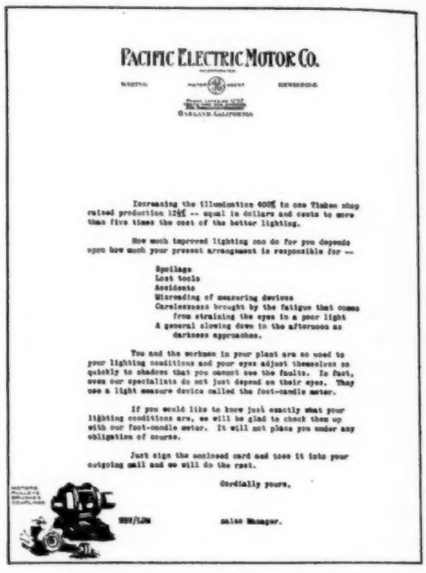
The company spends about $2,500 a year on advertising.

Most of the appropriations for advertising are spent on the house organ, "Industrial Electric News," which is mailed each month to about 1,000 customers, desirable prospects, and key men in related lines. The subject matter of the house organ, which is well illustrated with half tones, frequently includes an article featuring an interesting installation just completed for one of the larger industrials. In one issue, the "motorization" of a laundry was described; in another the burning and rebuilding of the plant of the New Metal Products Company was dramatically reported under the heading, "While the ruins smoked, Pacific Electric engineers directed the installation of motorized equipment."

W. D. Vance, sales manager of the concern, reports that these feature articles have been very effective, "not only for their interest to and effect on the average reader, but also for the pleasure which they give that particular customer."

Articles featuring installations are generally rewritten as publicity stories for the leading local newspaper and run in connection with a small advertisement once a month. So interesting have the features been that the newspaper often gives four times as much space in free publicity as they get in paid advertising.

Undoubtedly one of the reasons for the success of this monthly campaign



PACIFIC ELECTRIC MOTOR CO.

OAKLAND, CALIFORNIA

Increasing the illumination 400% in one Yakima shop raised production 12½% -- equal in dollars and cents to more than five times the cost of the better lighting.

How much improved lighting can do for you depends upon how much your present arrangement is responsible for --

Spoilage
Lost tools
Accidents
Miscounting of measuring devices
Carelessness brought by the fatigue that comes from straining the eyes in a poor light
A general slowing down in the afternoon as darkness approaches.

You and the workmen in your plant are so used to your lighting conditions and your eyes adjust themselves so quickly to shadows that you cannot see the faults. In fact, even our specialists do not just depend on their eyes. They use a light measure device called the foot-candle meter.

If you would like to know just exactly what your lighting conditions are, we will be glad to check them up with our foot-candle meter. It will not place you under any obligation of course.

Just sign the enclosed card and toss it into your outgoing mail and we will do the rest.

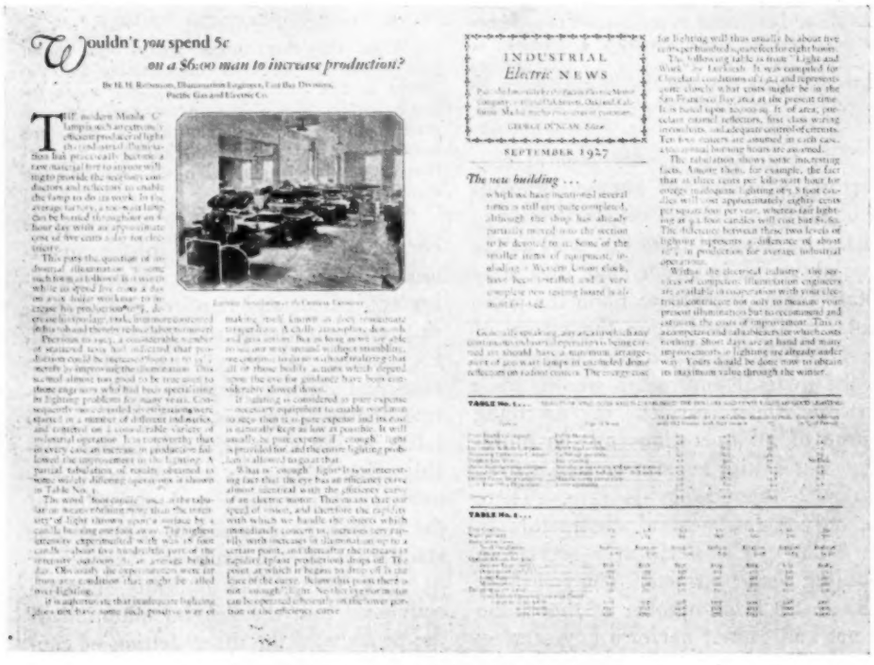
Cordially yours,

Sales Manager.

Sample Sales Letter

is the fact that little attempt is made to sell one individual motor or one installation on a price basis. The whole effort is to sell the idea of increased and cheaper production by factories which are well-planned and electrically equipped. A "Motorization Service" is featured in nearly every item of copy. An effort is made to have local industries employ trained engineers of the Pacific Electric Motor Company to survey the electrical problem of the factory as a whole. They study the rate of growth of the plant and estimate the future needs. Distributing lines are laid out with an eye to expansion, the power requirements of individual machines and the normal path of production. Motors are selected for their abilities to handle the particular requirements of different machines. Increased production economy, safety, and efficiency is the aim. Naturally, when the survey is completed the factory does not go out seeking bids on the job. The sale and installation job goes as a matter of course to the company which has aided in the plan.

An attractive series of one page cir-



Wouldn't *you* spend 5c *on a $6000 man to increase production?*

INDUSTRIAL *Electric* NEWS

SEPTEMBER 1927

The new building ...

Two Pages of the Successful House Organ

cular sales letters is mailed occasionally to the prospect list. Printed on attractive paper, and well laid out, the whole effect is designed to make the receiver want to read it. In one corner is tipped on a small rotogravure illustration of a corner of the shop, showing a stock of motors, shelves of parts and supplies, the motor "hospital" in operation, etc.

An occasional broadside or printed circular is mailed describing one or two used motors which are for sale. The price is not mentioned, but full details and specifications of the motor are given for the consideration of the prospective customer.

Adequate-Wiring Data for Lighting Circuits*

THE Underwriters' Code merely specifies wiring conditions with regard to fire hazard without giving consideration to the economy of operation. The size of wire for a lighting installation may conform strictly to the code and at the same time the circuits be of such length to cause excessive voltage drop. Inadequate wiring is directly responsible for the avoidable waste of electrical energy in overloaded circuits and results in low efficiency of lamps and unsatisfactory lighting conditions.

In order that a higher wattage lamp may be used in each outlet at any future date without necessitating a rearrangement of circuits, it is recommended that the capacity per outlet as given in Table I be allowed, and, in general, the number of outlets per circuit as follows: Where the capacity is 300 watts or less, not more than 8 per circuit; where 300 to 750 watts per outlet is specified, not more than 4 per circuit, and where more than 800 watts per outlet is specified, not over 2 per circuit.

Wire sizes for all classes of lighting installations should be such that the voltage drop between the panel box and outlets does not exceed 2 volts, computed for each length of run and for an allowance in capacity per outlet as given in Table I. Table II shows the wire size required for various conditions.

TABLE I—Light Outlet Capacities for Different Type of Occupancy.

Actual Floor Area Per Outlet.	Class A (Offices, drafting rooms, factories, etc.)	Class B (Stores, school rooms.)	Class C (Neighborhood stores, storage areas in factories* and basements.)	Class D (Storage areas in garages and unimportant basements)
Square Feet	Wattage Capacity Per Outlet			
65–75	300	200	150	100
75–85	300	250	150	100
85–95	350	250	200	100
95–110	400	300	200	100
110–125	450	350	250	150
125–140	500	400	250	150
140–160	600	450	300	150
160–190	700	500	350	200
190–220	800	600	400	200
220–260	950	700	450	250
260–300	1100	800	550	300
300–340	1250	950	650	300
340–390	1450	1100	750	350
390–440	1650	1250	850	400
440–500	....	1400	950	450
500–560	....	1600	1050	500
560–630	....	1800	1200	550
630–710	....	....	1350	650
710–800	....	....	1500	750
800–900	....	....	1700	850

*In factories it is often desirable to convert storage areas into work places to meet immediate production needs. For this reason, it is recommended that storage areas be wired according to Class B specifications.

*From "Illumination Design Data for Industrial and Commercial Interiors" by Ward Harrison and C. E. Weitz. National Lamp Works Bulletin 41-D.

TABLE II—Wire Size Required.

(Length of wire for a circuit is double the length of run.)

WATTS PER CIRCUIT

LENGTH OF RUN (PANEL BOX TO OUTLET)	100	150	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
30	14	14	14	14	14	14	14	14	14	14	14	14	14	12	12	12	12	10	10	10	10	10
40	14	The difference in the cost of wiring with No. 12 instead of No. 14 is so slight, and the advantages generally sufficient, that many electrical men specify No. 12 as the minimum size for branch circuits.						14	14	14	14	12	12	12	10	10	10	10	10	8	8	8
50	14							14	14	12	12	12	12	10	10	10	10	8	8	8	8	8
60	14							14	12	12	12	10	10	10	10	8	8	8	8	8	6	6
70	14	14	14	14	14	14	14	12	12	12	12	10	10	8	8	8	8	8	6	6	6	6
80	14	14	14	14	14	14	12	12	12	10	10	10	8	8	8	8	8	6	6	6	6	6
90	14	14	14	14	14	12	12	12	10	10	10	10	8	8	8	6	6	6	6	6	6	4
100	14	14	14	14	14	12	12	12	10	10	10	8	8	8	6	6	6	6	6	6	4	4
110	14	14	14	14	14	12	12	10	10	10	10	8	8	8	6	6	6	6	4	4	4	4
120	14	14	14	14	12	12	10	10	10	10	8	8	8	6	6	6	6	4	4	4	4	4
130	14	14	14	14	12	12	10	10	10	8	8	8	6	6	6	6	4	4	4	4	4	4
140	14	14	14	14	12	12	10	10	8	8	8	8	6	6	6	6	4	4	4	4	4	4
150	14	14	14	12	12	10	10	10	8	8	8	6	6	6	6	4	4	4	4	4	4	2
160	14	14	14	12	12	10	10	8	8	8	8	6	6	6	4	4	4	4	4	4	2	2
170	14	14	14	12	12	10	10	8	8	8	8	6	6	6	4	4	4	4	4	4	2	2
180	14	14	14	12	10	10	10	8	8	8	6	6	6	6	4	4	4	4	4	4	2	2
190	14	14	14	12	10	10	8	8	8	8	6	6	6	6	4	4	4	4	4	4	2	2
200	14	14	14	12	10	10	8	8	8	6	6	6	6	6	4	4	4	4	4	4	2	2
210	14	14	14	12	10	10	8	8	8	6	6	6	6	6	4	4	4	4	4	4	2	2
220	14	14	14	12	10	10	8	8	8	6	6	6	6	6	4	4	4	4	4	4	2	2
230	14	14	12	12	10	8	8	8	6	6	6	6	6	6	4	4	4	4	4	4	2	1
240	14	14	12	10	10	8	8	8	6	6	6	4	4	4	4	2	2	2	2	2	1	1
250	14	14	12	10	10	8	8	8	6	6	6	4	4	4	4	2	2	2	2	2	1	1

This table shows the wire size required for 115-volt circuits of various lengths of run, based on a drop of two volts between the panel board and the outlets. It is difficult in branch circuits, at least with present wiring methods, to use larger than No. 8 wire because of the difficulty of handling in conduit. Where the proper wire size for a proposed installation, according to this table, is larger than No. 8, it is usually best either to provide more circuits with less load, or to relocate distribution centers to decrease lengths of run. The dotted line shows the usual practical limits for circuit load and length of run.

Note—These recommendations on wiring are based on the allowances of The National Code: i. e. circuits equipped with medium screw sockets limited to 15 amperes and not more than 12 outlets per circuit; mogul sockets—limited to 40 amperes and 8 outlets per circuit. Present wiring practice is usually well within the limit allowed by the code. In some cases it is necessary to meet other requirements of local codes.

Collections--I

How to Collect From All Accounts Without Losing Customers or Decreasing the Volume of Sales

By HARR F. RANNEY
Associate Editor, The Electragist

THE ideal collection system begins before the sale. In small towns where the contractor knows everybody, it is simple enough to give each customer a credit rating; in larger cities there are always ways of finding facts about people, through banks, credit associations, references, etc. But in any case there are always a certain number of people whose credit is perfectly good—who will pay eventually—but who are very slow in paying their bills.

Some contractors can avoid this type of customer by running a strictly cash business, but most are not so fortunate. Volume of sales must be maintained, and consequently it becomes necessary to sell to slow pay customers, even though it is more expensive to do so. And this can be done without loss if the collection system is efficient and wisely managed. The collection system can be just as sound and effective in a small town where the contractor is a friend to all his customers as in a large city where the contractor has a collection manager—the principles are much the same.

Of course it costs more to have slow accounts. One contractor in Lancaster, Pa., has kept records from which he has learned that it costs twelve percent more to run a credit business than it does to run a cash business. This contractor is trying to develop a system by which the good cash customer has the advantage, and the slow pay customer has to pay more. This can be done in several ways, of which the best is to mark up prices and give a large discount for payments within ten days or a month.

Many contractors give a small cash discount of two percent for payment within ten days. Of 115 contractors all over the country who were approached on this question, 51 percent give a discount for quick payment and 49 percent do not. Some of the ones who give discount, however, state that this is given only on materials, fixtures, appliances, etc., and not any bill involving labor. Several contractors give a discount of 5 percent on material, but no discount on labor; and one of the 115 gives 10 percent off list price of merchandise for payment within ten days.

THE purpose of a collection system is to get the money in quickly, to keep desirable customers, and to permit the sales department to maintain a good volume of sales. The most important of these is getting the money quickly, because the more close and fast collecting the contractor is the better the customer likes it and the easier it is to extend credit again. Most people prefer to pay their bills and if they are not encouraged to pay them quickly they will often refrain from entering the store just because they owe the proprietor money. The slow collector suffers, not only in loss of the use of the money due him, but also in actual money losses from people who might have paid, loss of sales from people who won't buy when they already owe money, and loss of volume of sales because he can't extend more credit.

This article discusses some phases of the collection problem, indicates solutions, and describes the best practice in use among successful electrical contractors all over the country, large and small.

One man who has tried both discounts and no discounts reports that he gets collections just as quickly without giving a discount. Too many people, he said, take advantage of the discount long after the ten-day period has passed. Many, according to this contractor, took the two percent off a bill paid as late as the tenth of the following month. Having tried the discount he began stamping all invoices "Net Cash" and states he is saving hundreds of dollars a year without bad effects on collections. However, he has very few slow pay customers and it is not necessary to give an inducement to bring the checks in quickly.

A contractor who has a considerable installment sales business bills all appliances with a year's interest added to the price. Then if the customer pays within thirty days he gets a discount of this amount.

Customers in general can be divided into three classes, though there are several subdivisions of each class and any collection system must be flexible enough to take care of all cases. The first class of customers are those who pay at once, within ten days or a month. The second are the slow customers who always pay eventually. The third are the real dead beats who either never intended to pay or who get themselves into such deep debts that they can't pay. With the first class there is no difficulty. A simple bill upon the completion of the contract or at the end of the month in which merchandise is purchased produces the check. If it doesn't come in within a month, a statement will always be sufficient for this group.

The slow pay accounts must be watched with more care. The A. C. Sweetman Electric Company of Waterloo, Iowa, keeps in close touch with the local credit association and reports all slow customers at once so they cannot overload their credit at other stores. This is a vital point because it often prevents the slow pay customer (class two) from involuntarily falling into class three by contracting too many debts.

The only guaranteed way to collect accounts from the dead beats is never to give them any credit. M. H. Salmon, of Syracuse, N. Y., comments on this point: "We spend our time in investigation before we take on any new accounts, and as a result do not have to spend much time on our receivables."

Prompt Billing

Most contractors agree that the best collection systems are the ones that go into operation quickly, ask persistently but kindly for the money, and keep regularly after the man until he pays.

Getting out bills promptly is the first step. Seventy-one percent of the 115 electrical contractors in this survey send out bills on either the first day of the month following purchase, or the last day of the month of the purchase. The next most popular day is the tenth of the month, and this, while it has the disadvantage that it arrives after people often have spent all their money, has the advantage of coming at a time when few other bills are being received.

The follow-up should be made promptly within thirty days, although a few wait sixty days. Nearly 10 percent start the follow-up a week after the first bills go out, but this seems a little too soon. Those who give a ten-day cash discount may well send a second bill five days after the first calling attention to the end of the discount period.

Generally a statement is sufficient for the first follow-up, though some people use a carbon copy of the original bill, and a number of contractors use some form of rubber stamp such as: "*Overdue*"; "*Please Remit*"; or "*Your Attention is Called to This Invoice*".

By the end of forty-five days all the good cash customers have paid, except those who are out of town, temporarily unable to pay, or dissatisfied with the work or merchandise. That is the time to start a real follow-up campaign and the next two months indicate whether the account is going to be collected at a profit or a loss. Most contractors agree that accounts carried six months or more which have to be put into the hands of a collector or lawyer are too expensive to be worth while. An efficient collection system should produce the check from the slow pay account in less than 120 days.

Using the Telephone

A great many contractors make use of the telephone to pursue delinquent customers. About 75 percent of those questioned stated that they used the telephone regularly as a part of their collection efforts. Most of these telephone at least once a week and a number telephone daily until a promise of payment is made. On the day promised the customer should be called immediately and often pays because he hates to be told that he has broken his word. The telephone is a quick method of getting in touch with local customers, finding out why they haven't paid, explaining items in the bill, making adjustments of complaints, before the customer has become hardened to appeals for money.

The personal call is even more popular than the telephone as a method of collection. Seventy-eight percent resort to this method if the check does not come in on the first or second invoice. In some cases the personal call is made by the salesman who made the original sale, as the customer knows him and he has an immediate entry. He can also explain away complaints if necessary. Other contractors feel that an entirely different man with a different personality can collect the money better than the salesman, against whom the customer may have a grudge. These concerns have a special collection manager, or send their bookkeeper out to call on delinquents.

In a small community the personal call is especially effective. E. C. Smith, of Seaside, Oregon, writes: "In a small community like Seaside, the radius for making personal calls and collections takes about one day's time, and this system pays as it enables you to keep in touch with your customers. Complaints are adjusted and a better collection percentage is the result. Frequently it is the means of another sale or small job, but best of all it saves your statement from the waste basket if the account happens to be in the class who pay only when urged." Mr. Smith does not send out any statements at all, but makes all collections by personally calling on his customers once a month.

The relative merits of special collection men and a contractor's own salesmen, employees, or himself, is somewhat debated among electrical men. About 70 percent prefer to send one of their own men, but 30 percent hire special collectors or collection agencies to do the job. One man in Kansas, however, feels that collectors or collection agencies are very poor help. "Out of $78.00 turned over to one agency," he says, "we received a remittance of $2.50, and half of that went to them for collection. We again took up the accounts ourselves and collected over 50 percent of them. In only one case we had to serve a garnishment."

Most collectors charge at least 50 percent for collections, but one contractor has an arrangement by which he pays 25 percent to the collector who pays all costs, including court costs, if a suit is necessary. This collector gets all accounts over sixty days old, and of course some of them are easy to get.

Collecting by Mail

Most contractors use the mails in making collections. A series of collection letters are mailed to slow accounts, or a series of printed cards are used. In some cases a sticker is pasted on the invoice, requesting early payment. Some contractors have an arrangement with one of the national collection agencies whereby letters are sent out to slow accounts on the letterhead of the national agency. There is some disagreement about the value of this system. One contractor comments that these collec-

Short Letters Produce Checks

THIS series of collection letters is used by the Barker-Fowler Electric Company, of Lansing, Mich. with good success.

Number One

We are enclosing herewith statement of your account, which according to our terms is now due, and we would appreciate your check to cover at an early date.

Thanking you in advance for this courtesy, we are,

Yours very truly,

Number Two

The enclosed statement shows a balance of (amount) which according to our terms is now past due.

Should there be any question regarding this account, please let us know at your earliest convenience, but if not, your check to cover would be greatly appreciated.

Thanking you for your patronage, and trusting that we may again be allowed to serve you, we are,

Yours very truly,

Number Three

We have mailed you several letters and statements regarding your account which is now past due, but evidently this matter has been overlooked by you.

In order to meet our own obligations, it is necessary that we receive remittance on accounts outstanding against our customers when due.

Your cooperation will be greatly appreciated.

Very truly yours,

Number Four

The enclosed statement shows a balance which according to our records is now sixty days past due.

Kindly favor us with your check at an early date.

Yours very truly,

tion forms are very successful on small accounts; while another says that they were very ineffective.

In states where the lien laws are satisfactory, contractors generally put the slow accounts in the hands of lawyers for lien within the lien period which may be sixty or ninety days. This, of course, is most generally used on construction jobs where the work is done for a building contractor, and is not effective for regular customers of wiring or merchandise. Most contractors who put accounts in the hands of lawyers select six months as the right time. Others say that it is so unprofitable to sue that they never do it, except in the case of very large accounts. The majority of contractors either never sue or only very rarely. Quite a few, however, feel that a suit and some money is better than none at all, so they enter suit in 1 or 2 percent of their accounts.

The percentage written-off depends a great deal on the method of accounting. Some contractors write off all accounts ninety days or more overdue at the end of the year. Others carry accounts a year or even more—nearly 30 percent carry them over a year—and eventually collect most of them. The majority favor carrying them in suspended accounts and continuing to try to collect, although the accounts are written-off the books.

The percentage of write-off varies from less than ½ of 1 percent to 5 percent, although 1 percent seems to be about the average. This agrees with national figures which show that of all accounts in all lines, approximately 99 percent are eventually collected. The contractor's aim should be to collect his 99 percent in the shortest possible time and the least expense, without losing sales or customers.

Interest on Overdue Accounts

Contractors are equally divided as to whether to charge interest on overdue accounts or not. Exactly half charge interest, and one of those who does not says, "We try to". Sometimes it is difficult to collect interest from slow customers, and if insisting on the interest means losing the customer, contractors, like everyone else, are prone to give in. The percentage charged is usually governed by the local laws. In most cases, 6 percent is the charge; a few charge 7 percent, a few more get 8 percent, two get 10 percent; and two charge 1 percent per month on all overdue accounts.

Nearly half the contractors sell some merchandise on time payments. The collection of time payment accounts is a somewhat different problem from ordinary collections. One man who has cash, charge, and time accounts states that the time accounts are easier to collect than the charge accounts and, since they bear interest, are more profitable. A carrying charge is almost always added to merchandise sold on the installment plan, varying from 6 to 10 percent. A note or chattel mortgage is usually signed, and this may be discounted at the bank.

A great many contractors bill wiring separately from merchandise. Contractor dealers who have a wiring business and a merchandise business with charge accounts usually bill the wiring immediately upon completion of the job, or in larger jobs 85 percent monthly and the balance on completion. The merchandise is billed separately at the end of the month of purchase. Few contractors allow a cash discount for quick payment on wiring or any other bill which includes labor.

Whether bills should be itemized in detail or not is a point on which there is some discussion, but which is not particularly important in a collecton program. Itemizing of bills sometimes prevents complaints, and sometimes increases them, although the weight of opinion seems to favor itemizing in detail, even on wiring job statements. Merchandise is always itemized. The small contractor can itemize accounts easier than the large company, and generally the purchaser of a small job prefers to have a detailed statement.

Keeping Records

The efficient keeping of records is an important part of a good collection job. Some form of tickler file is necessary to keep track of billing dates, and overdue accounts should be kept out on the collector's, owner's or manager's desk where they can be watched carefully. One contractor takes these cards home with him and telephones the delinquents day and night until he gets the money. The Buzzell Electric Works, San Francisco, keeps a list of delinquent accounts on the desk at all times showing in detail how far back each account runs. This is made out at the beginning of each month, in duplicate. One copy goes to the collector and one is kept on the manager's desk, and both of these executives go after the money by every method all the time. As they are paid the cashier marks the cards at once so that the list is always up to date.

Keeping persistently at it is one of the prime requisites of success in making collections. To do this it is necessary to assign the job to somebody in the organization, whether the owner, the bookkeeper, or some other person who is charged with the job of getting out invoices promptly and seeing that the follow-ups are not delayed.

(To Be Continued)

Two Letters That Succeed

THE following two letters are used by the Guarantee Electric Shop, Battle Creek, Mich., to collect overdue accounts:

Number One

Our statements are sent out regularly, listing only items which are past due, because no matter how much we might feel like extending credit to the 500 people on our books it would be impossible to do so excepting for a limited time. A credit of only $10.00 to each one would mean $5,000 for us to carry, thus it becomes necessary for us to ask that all accounts whether large or small be met promptly and in a spirit of fair play.

We believe you have overlooked this matter and we know you would prefer to have us remind you rather than permit a matter of oversight to occasion the appearance of a past-due charge on your account.

We trust this letter will be taken in the friendly spirit in which it is written and that it may be the means of furthering the existing good will between us.

Thanking you in anticipation of prompt settlement, we remain

Yours very truly,
GUARANTEE ELECTRIC SHOP
Credit Dept.

Number Two

You have been notified about your past due account and have had sufficient time in which to have taken care of it, but apparently have not given it any attention. Naturally we cannot permit it to continue in its present condition.

If you cannot pay the full amount past due, you should make a payment to apply on account and arrange for terms on the balance. You should at least be frank with us, as we have no desire to treat you harshly.

Further neglect of this matter, however, will make it necessary for us to class the account as delinquent and handle it accordingly.

Yours very truly,
GUARANTEE ELECTRIC SHOP
Credit Dept.

Where Electragists Will Meet

Stevens Hotel in Chicago is Ideal for Next Annual Electragist Convention

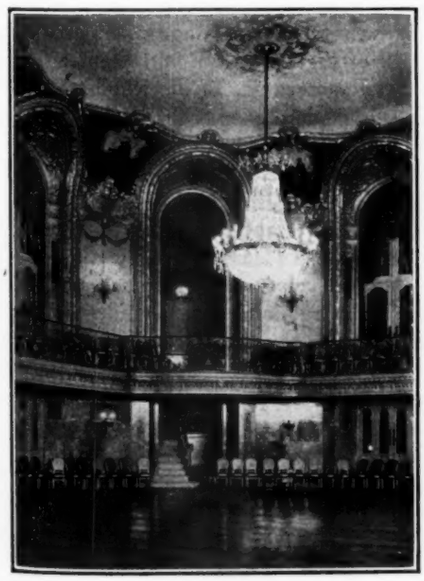
TOWERING twenty-five stories above the world famous Michigan Boulevard, Chicago, stands the Stevens Hotel, where electragists will gather August 6 for the 1928 national convention. Toward the north lies Lake Michigan, where midsummer excursionists sail and swim, and from which come cooling breezes that make conventionists happy.

The Stevens is the largest hotel in the world, a vast city within a city, which can take care of everyone who attends the convention, and supply every want. There are 3,000 rooms in the hotel, each an outside room and each with a bath. If a man should decide to sleep in a different room every night, he could stay at the Stevens nearly ten years without entering the same room twice.

When the order for mattresses and springs was filled, it required a full train of 65 freight cars to bring the 3,280 sets of hair mattresses and upholstered springs. In making these, 65 tons of hair were used, 6,500 yards of ticking, 4 carloads of lumber, 35 tons of springs, and 5 tons of twine. There are 50,000 yards of carpet in the bedrooms; this would make a carpet a yard wide and 30 miles long.

The convention meetings will be held in the grand ballroom, a corner of which is shown. This is recognized as one of the most beautiful rooms to be found in America, with gorgeous paintings all around the ceiling, high draped french doors circling the room, marble walls, and a visitors' gallery railed with a specially designed metal work grilling. This is a large room, capable of seating 3,000 people, and there is not a single pillar or obstruction. To accomplish this a new special steel construction was necessary, and now the ceiling and the rest of the building is supported over the ball room by immense steel trusses, able to support a weight of 5,000 tons, or the equivalent of 25 200-ton locomotives. Entrance to the convention hall is obtained from the grand staircase, surmounted by tall grecian pillars, through which the sunlight streams.

In connection with the Electragist Convention there will be a manufacturers' exhibit, where many electrical devices will be shown.



The Ball Room

The Grand Stairway

Job Management

By ROBERT A. GOELLER
Vice President in Charge of Construction, Hatzel & Buehler, Inc., New York, N. Y.

THE problems of job management seem a subject of never ending discussion. Tomes have been written in the past and the future holds even greater promise in this direction as more searching study is made of the subject. This article purposes to deal with the question in its broader details from an electragist's point of view.

In a large building operation where the electrical work is a unit in the composition of the whole, the factors beyond control bulk large in percentage over those which the electragist can command. How important is it then that each job receive the closest study and supervision to counteract these uncontrollable conditions and at the same time operate efficiently as a unit organization, meeting every demand imposed upon it.

Bearing in mind that, generally, the materials entering into the work are composed of standard units readily obtained in the open market, the handling and assembly of them into a complete and effective operating whole with the greatest possible economy, dictates a thorough understanding of job management.

Starting a Job

A sound basis for starting a job is first a broad visualization of the work and the selection of the man to place in charge, next a thorough study and understanding of the work involved, which naturally brings out the various classifications and the percentage each one bears to the whole, and then the possible use of labor saving tools and equipment as an aid to mass production and the handling and distribution of materials so produced.

An efficient electrical installation is mainly a matter of studied assembly by job labor, therefore the manning of the operation with competent mechanics is another factor of prime importance of which much can be said. Non-productive labor is a necessary but very insidious factor that must be considered very carefully.

The method of delivery of materials, handling, storing and distributing them to the point of installation is reflected in job costs and then there is also the matter of cooperation and coordination between the office and job—a factor sometimes overlooked. We should consider the alternate methods of the requisitioning of materials from the job or through the office and also the policy of advising the foreman of the estimated labor allowance.

HOW often do we hear a contractor say that he lost money on a job because the labor ran far beyond his estimate? Why should labor costs become excessive? There are times, of course, when some elements enter over which the contractor can have no control, but generally speaking the element of labor should be no more uncertain than material. Labor costs run all over the lot, generally speaking, because the contractor has never taken the trouble to learn how to run a job efficiently,—in other words he does not know the principles of job management. In the present article Mr. Goeller outlines the subject generally. In succeeding issues we shall present the elements in more detail, drawing upon successful practice.—The Editor.

Job management comprises the training of foremen in the problem of handling men, gathering labor costs, job estimating on extras, proper contact with owners and architects' representatives—efficient handling of the work so as to keep in step with other trades, holding of work in reserve to take care of bad weather conditions and other unusual circumstances.

Training of men in specialized lines is a subject requiring much thought, as is the knowledge of proper placing of men on work for which they are best qualified by experience and temperament, while an apprenticeship system is a very important branch in job management, embracing as it does, the embryonic material that will later take its place in carrying on the work of our industry. The National Electrical Code and local ordinances should receive due consideration in the general plan.

Catalogs and informative data should also be freely supplied to foremen as oftentimes through lack of knowledge of what the industry affords to take care of his particular problem, work may be done in a costly and perhaps not particularly effective manner.

Let us then go into more detail concerning some of the factors above mentioned. Assuming that the sales work in winning the contract is complete and that the plans are available for use in proceeding with the work, we now review them carefully with an eye to the proper man to handle the work.

The Foreman

As we go into more detailed study we see which type of work predominates and we begin to fit the various candidates' qualifications to the job. Their experience on that type of work which bulks largest and their past record for efficient handling of the work of a similar character helps us determine the best one for the job. Nor should we lose sight of the fact that a large majority of electrical work is installed simultaneously with other trades, whose cooperation is very essential to the efficiency of our own operation. Therefore, a foreman with the friendly cooperative spirit, ready to give and take, tactful in difficult situations, capable of handling his own men and obtaining the good will of others with whom he is in contact, is essential.

If the job is an office or loft building wherein conduit and wire are the bulk of the work and equipment is but a small percentage of the whole, such a job, if moderate in size, will serve well as a training ground for the young and ambitious foreman whose energy can be applied to a simple form of construction, before leading up to the bigger and more complicated work.

Having selected the foreman, he and the construction superintendent must first study the specifications together. This study will bring out the high lights and will bare points that need further interpretation or more definite advice. Plans are also reviewed and ways and means are studied to best accomplish the work outlined. Study of structural details surrounding the work at this early stage is often very profitable in that modifications of structural detail can sometimes be arranged that will

permit the work to be installed with considerable economy of material and labor. Such changes seldom could be brought about if suggested at a more advanced point of construction. This also applies to modifications in the planned and specified methods of construction, where possible economics might be suggested if presented in the early stages of the job.

Proceeding to the job, the foreman is introduced to various people in charge of directing the operation, on various parts of it, as may directly or indirectly affect his work. Too much emphasis cannot be placed on the importance of this first meeting. Initial impressions mean much and their effect is often a factor throughout the life of an entire operation. Such meetings should be free from argumentative discussion and serious differences of opinion should be avoided if for no other reason than that usually the first meeting does not permit of a full understanding of the reasoning processes of the other party. When this and personal idiosyncrasies are better understood a more persistent stand may often be taken with less chance of offense.

Job Headquarters

The location of job headquarters and point of receiving, storing materials should be carefully considered and discussed with those in general charge. Usually it is preferable to determine in advance what location is best suited to the job requirements, that is, a point which will be nearest to the greatest bulk of the work or near hoists, elevators and stairways that provide quick access thereto. With a logical location in mind that can be maintained as long as possible throughout the life of the job we can now request permission for the place chosen with a fair chance of having our request granted. By taking the initiative, undesirable locations are often avoided and unprofitable controversies prevented.

Oftentimes the job headquarters take up considerable floor space that will interfere with the installation of conduits, etc., as the job progresses. Expensive pick-up work can be avoided if lockers are blocked off the floor several inches permitting the installation of conduits thereunder. The work under such spaces can oftentimes be installed prior to the placing of lockers which is even better.

As the job expands and the work spreads, supplementary tool and material lockers or tool chests can be distributed about the job saving considerable time (and money naturally) by keeping the men longer at productive tasks.

Hand tool boxes with separate compartments for tools and miscellaneous materials help to increase efficiency without extra physical effort and save many minutes each day.

Tool equipment in good condition is an important factor in producing low costs and in these days of high priced labor the matter is beginning to receive the attention which it deserves. Some companies make it a point never to transfer tools from job to job but always route them through the shop for cleaning, repairs, replacements of parts. In purchasing tool equipment initial price should be only one consideration —simplicity, correctness of design, ruggedness, long life are the important factors. Generally it will be found that simplicity of design in tools works out more economically in the long run and any tool that does one thing well and stands up without continual adjustment will more often than not offset by a wide margin its seeming limitations.

Power Tools

Power driven tools are being marketed that greatly increase production and oftentimes pay for themselves in one large operation. Readily available source of current is a factor in the economical use of power driven devices. Quantity production is also essential, for in their use there is first the initial set up, then oftentimes moving and later dismantling costs. A power threading machine set up centrally in relation to the work may be desirable —particularly if the conduit sizes and lengths are diversified. There are certain kinds of power drives that can be adapted to a number of other uses as the job progresses, reducing the tool investment and at the same time increasing production.

Conduit bending machines ranging all the way from ½ in. to 6 in. can be obtained that work wonders for economy and their use will often save many dollars and add to the quality of the job as well. Electric drills hardly need mention while the use of electric hammers requires some study. Such tools are very effective when there is considerable density of work and current is readily available but work that is spread out over a large area and in small quantities makes it more difficult to decide between the machine and hand methods.

Handling Material

The handling of material on a large operation runs into a considerable sum of money which may be reduced by careful study. In the average installation, conduit by its weight, bulk and labor, cost of installation, is the largest single item of work and naturally demands attention in proportion. Oftentimes carload lots can be trucked direct to job and stand there available for instant demand. Carload purchases over warehouse shipments usually save money, but the final decision on the two methods calls for good team work between the purchasing and construction departments, if true savings are to be effected, for if materials purchased in bulk at lower prices cannot be stored on the job until used, without considerable handling, the apparent saving is often offset and more in extra field labor.

Cooperation between office and job on the ordering and delivery of materials is profitable in more ways than one. The arrival of materials may fall behind the progress of other work doubling perhaps the labor cost over what it would have been if they had arrived in time. Then, too, work will often be started and a gang organized to carry it along predicated on the expectation that suceeding shipments will follow the initial one in proper sequence and without delay. Then comes stoppage of work because certain materials which would be required somewhat later were shipped instead of those which should have succeeded the previous shipments, thereby causing a well organized force to be broken up and placed on other work, a move that is demoralizing in spirit and costly in money. A proper schedule of deliveries worked up between the job and office and transmitted to the manufacturer or supplier will often avoid such costly delays.

Correct materials in proper quantities, available without too much handling, often prove many times more effective than driving men who are improperly supplied and enable them to finish the work completely as they go and not have to improvise substitutes to take the place of missing materials so that other work can proceed.

Delivery of Material

Outside of the actual labor, no other item is of so great importance as the delivery of materials on time and of correct type for the work, or assembled completely and without errors so that they can immediately be installed without costly delays or changes. The arrival of materials before they are actually required is essential to the economical operation of the job; yet due consideration will prevent unnecessary investment of materials on the job and on which payments cannot be obtained until installed. Thus, when properly worked out, deliveries that ordinarily might arrive towards the end of the month with small chance of being installed before that time can be held back until the first of the new month, thus tending to keep job investment and collections more in line and oftentimes permitting the taking of cash discounts that otherwise might not be possible.

While on the subject of materials it might not be amiss to discuss the relative merits of requisitioning materials for the job—understand, not their actual purchase but the compilation of quantities arrived at from actual field requirements. Of the methods to be discussed, perhaps the one most in use is the determination of job requirements in the office either from a further review of the plans or by reference to the estimating sheets. This method's chief merit lies in the fact that the time taken is not chargeable to direct field costs but is absorbed as overhead and also because the person in the office designated for this work is usually quite skilled from constant practice.

If the foregoing procedure is pursued, several weaknesses usually appear; first that the materials ordered, while perhaps right as to quantities, may arrive in the wrong sequence. More fraught with danger, however, is the fact that the man in charge of the job has only the most sketchy conception of the quantities involved and therefore is not in a strong position to decide whether the particular materials are arriving in adequate quantities to keep pace with the job. It is quite easy to comprehend, too, that the man on the job can never quite get the full conception of the component parts so that he is able to know them intimately only after the work is well under way and not beforehand as he should. This often leads to loss of time, increased costs, lack of preparation and failure to deliver the service expected. Such a method also tends to increase the overhead costs by requiring closer supervision from the office, and where the number of jobs increase rapidly during seasonal peaks a great burden is often placed upon individuals whose efficiency is seriously impaired thereby and all the operations are liable to suffer.

Routine

If the responsibility for ordering materials for a number of jobs is placed in one man, then some procedure should be set up to advise at once the foreman in charge of the various jobs what materials have been ordered and when they are expected for delivery. Such a procedure gives the foreman a chance to compare the materials ordered with his idea of job requirements and errors and omissions may be caught in time thereby avoiding costly delays in the execution of the work.

In direct contrast to the preceding method is the one whereby the foreman is responsible for the requisitioning of all materials with the possible exception of special or large equipment. Such an arrangement, of course, appears to transfer overhead supervisory cost to the job as field costs with the work being done usually by men not particularly skilled in it. This, however, holds only until the men are properly trained, after which time a very flexible organization is created whereby each job becomes a self-operating unit capable of more efficient management and direction.

It will be generally conceded, I believe, that the foreman's first duty in starting a job is to make a careful study of the plans and specifications and the way to make the former divulge their most intimate secrets, so as to arrive at a complete understanding is for the foreman to take off the materials and equipment entering into the work. This process raises, so to speak, the foreman's vision, permitting him to see and understand the job in a broader sense and to anticipate problems and work out their solutions prior to the actual start of the work. Such a course often permits the design of special pull-boxes, cabinets, hangers, etc.

Close forehand study of material requirements will often bring into focus the fact that there may be a large bulk of similar work that will permit of the economic use of labor saving tools and equipment that can be arranged for the set-up in sufficient time to make their utilization most effective. With the foreman trained in taking off quantities of materials it is but a short step to have him associated with material factors, labor cost units, thus further broadening his vision and attuning his thinking to harmonize with the methods used by the office in determining the original estimated cost. This training is important in that it enables the foreman to prepare for the office estimates on additional work where his intimate knowledge of the job will often see short cuts as well as costly obstacles that have to be taken into consideration.

Drillings

Another example of the field furnishing direct advice to the office is in the matter of drillings for panel cabinets, design of pull boxes and arrangement of conduits entering therein. Foremen trained in such work are able to save considerable money for their employers by laying out the arrangement of conduit holes so as to permit the conduits to be installed in the most economical manner. Field layouts of pull boxes can oftentimes save expense by eliminating elbows, bends and the like.

For the use of our foremen we have prepared our own drilling sheets on cross section paper which is shown in Fig. 1. The items at the top were designed to bring out all the pertinent data necessary for the manufacturers' information. If this were not forthcoming it would lead to delays or to guesswork, which by the law of averages will never be correct more than 50 percent of the time.

At the bottom left are set down general notes for the foreman's benefit, while at the lower right hand is provided data as an aid in laying out conduit spacings quickly. A close study will reveal that not only the minimum spacing between two conduits of the same size are given but that the spacing between conduits of different size can be obtained with equal facility. Another interesting feature is the "end spacing" column which gives the minimum spacing from center of conduit to side or back of box. A column giving size of conduit holes is also provided. An original and two copies are made. The former and one copy are forwarded to office, which retains the copy and after proper checking for-

wards the original to the manufacturer. If the office makes out the drilling sheets, one copy, of course, is sent to the job for its check and record.

An item in the execution of any contract, be it large or small, is the non-productive labor. This is a very insidious and elusive item that may add to direct productive costs such additional expense as to make the net unit unduly high. Such non-productive costs are usually composed of all or part of the foreman's time according to the size of job, handling and delivery of materials, loss of time due to moving men about from one piece of work to another, caused perhaps by a shortage of men, materials or improper instructions, time keeping material, stock and tool handling, organizing at the start and cleaning up at the finish, inspection trips and last but not least changes in plans which will oftentimes upset an economical construction schedule and generally increase labor costs on work only indirectly affected by the changes.

While speaking of changes and their effect on basic labor costs our company has made an analysis of some of the non-productive factors that are brought about by modifications in plans which may perhaps give some of us a jar for when so-called "good extras" are analyzed in its light, more than likely the margin allowed for profit will be entirely absorbed in offsetting other indirect costs.

To forcibly bring out the ordinary obscure items of expense in connecton with extra work, both for the benefit of the foreman and client's representative, should they care to check estimates on extras, we have prepared an estimate sheet as shown in Fig. 2. The column on the left headed "Other Expense" enumerates a number of these factors and emphasizes several chargeable items that are far too often absorbed by the contract proper. Oftentimes a job phone is installed and when extras appear it is used extensively in ordering and rounding up materials needed in a hurry. Liability insurance on labor is an item taken care of but not so are inspection charges on additional work, which may be overlooked and then absorbed later in the expense of the original contract.

Other items are freight, express and cartage (oftentimes paid on materials ordered for the contract but subsequently used on extra work). Carfare for running after miscellaneous materials quickly mounts up. The cost of handling materials on their arrival at job and their distribution about the building is often neglected. There is the "lame back labor" which covers in part the time of going back over the work, perhaps while the bricklayers are building in the work, or adjusting it to the finished surface later on. The charge for supervisory labor, that is, that time taken up by the foreman in studying changes in plans, ordering and receiving materials and directing the work, oftentimes ranges between 20 to 30 percent of the actual productive costs. "Lost time" labor comes when men are drawn away from contract work, seriously affecting their normal production, and likewise when they pick up a piece of work that was temporarily laid down. Sundry materials are often lost sight of and locker stocks are drawn upon for screws, bolts, plugs, tie wire and what not for extra work that should bear its pro-rata share. Tools or tool parts, such as dies and hacksaw blades, should not be forgotten, and hoisting charges on conduit, wire, etc., should be recognized in proper proportion to the amount of materials used on extra work. Estimating on changes in plans and check-

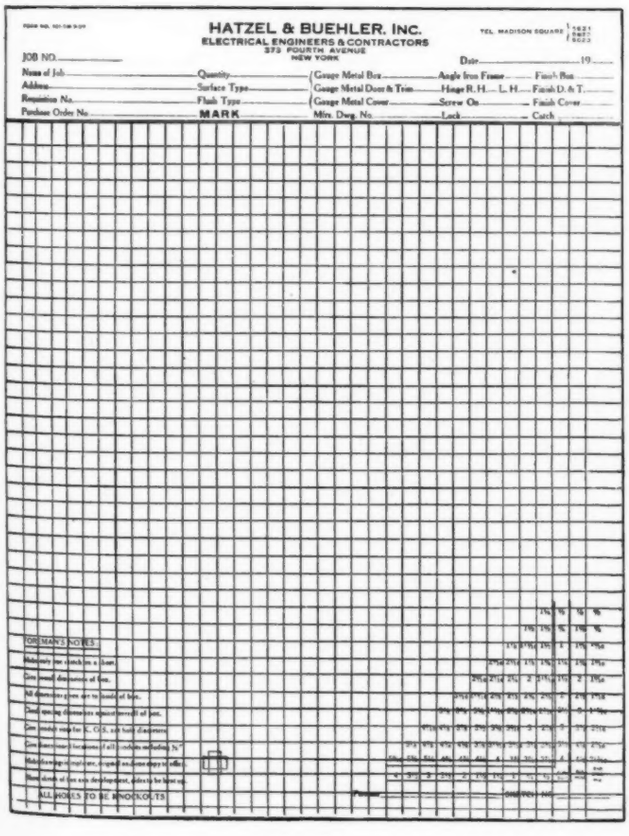

HATZEL & BUEHLER, INC.
ELECTRICAL ENGINEERS & CONTRACTORS
373 FOURTH AVENUE
NEW YORK
TEL. MADISON SQUARE
JOB NO.
Name of Job
Address
Requisition No.
Purchase Order No.
Quantity
Surface Type
Flush Type
MARK
Gauge Metal Box
Gauge Metal Door & Trim
Gauge Metal Cover
Mfrs. Dwg. No.
Angle Iron Frame
Hinge R. H. L. H.
Screw On
Lock
Finish Box
Finish D. & T.
Finish Cover
Catch
Date
19
FOREMAN'S NOTES
ALL HOLES TO BE KNOCK OUTS

Fig. 1

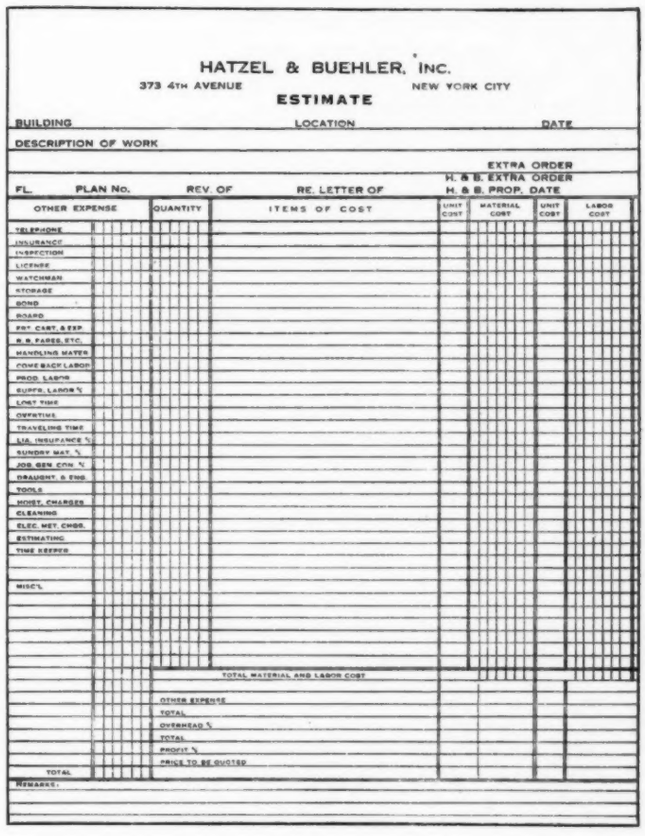

HATZEL & BUEHLER, INC.
373 4TH AVENUE
NEW YORK CITY
ESTIMATE
BUILDING
LOCATION
DATE
DESCRIPTION OF WORK
EXTRA ORDER
H. & B. EXTRA ORDER
H. & B. PROP. DATE
FL.
PLAN No.
REV. OF
RE. LETTER OF
OTHER EXPENSE
QUANTITY
ITEMS OF COST
UNIT COST
MATERIAL COST
UNIT COST
LABOR COST
TELEPHONE
INSURANCE
INSPECTION
LICENSE
WATCHMAN
STORAGE
BOND
BOARD
FRT. CART. & EXP.
R. R. FARES, ETC.
HANDLING MATER.
COME BACK LABOR
PROD. LABOR
SUPPS. LABOR %
LOST TIME
OVERTIME
TRAVELING TIME
LIA. INSURANCE %
SUNDRY MAT. %
JOB. GEN. EXP. %
DRAUGHT. & ENG.
TOOLS
HOIST. CHARGES
CLEANING
ELEC. MET. CHGS.
ESTIMATING
TIME KEEPER
MISC'L.
TOTAL MATERIAL AND LABOR COST
OTHER EXPENSE
TOTAL
OVERHEAD %
TOTAL
PROFIT %
PRICE TO BE QUOTED
TOTAL
REMARKS:

Fig. 2

ing estimates have been proven to take, at times, actually as much time expressed in dollars as the direct labor to do the job. Time keeping on a large job as a rule requires a clerk whose work is greatly increased by extra work and it should naturally bear its share of such expense.

While the foregoing items are small in individual detail the sum total of them is frequently startling and in efficient job management they cannot afford to be overlooked.

The policy of advising the foreman of the estimated labor allowance may be subject to honest differences of opinion but the writer takes the stand that any foreman worthy of the name is so essentially the contractor's representative that the entrustment of this confidence is imperative to his best business interests. Psychologically, most men are at their best when winning and to mark down the labor allowance may have more disadvantages than advantages.

Gathering Data

Interest in gathering labor costs by the foreman is a subject that in most cases must be cultivated rather than forced. To start with, the average job does not permit of a cost clerk and the burden must therefore fall on the foreman. To start off at once expecting a foreman to keep track of every item of work done and its cost would probably take so much of his time that production would suffer materially and non-productive costs mount excessively. Interest in gathering labor costs can be stimulated gradually by selecting a certain type of work of considerable quantity—say like ½ in. or ¾ in. conduit, circuit wire or switches and receptacles, and asking that all time expended on the item selected be recorded. Then, when the work is finished, a simple process of division gives us the unit cost. This process opens up to the foreman an angle of his trade that more than likely he had failed to grasp before. This placing of labor unit alongside of or in harness, so to speak, with a material unit usually makes a deep impression that may be gradually built upon and expanded. The value of this broadening process is beneficial to the electragist and foreman alike.

Estimating on extra work, when conditions are greatly involved becomes more nearly accurate as the foreman understands labor costs. With this additional qualification he becomes of great assistance to the office, especially when times are busy and details multiply.

Job management also means man management in which the foreman is the vital factor. The handling of men in a way to enlist true cooperation and loyalty is a valuable asset in foremen, and a trait that should be encouraged and developed. The day of impoverished labor, wherein it could be driven unreasonably, and by which the contractor profited not one whit but simply lowered his price in line with his lesser costs—hoping to meet pauperizing competition, has, we hope, passed for good. Yet these bettered conditions are not without their responsibility, alike to electragist and worker for production costs must be based upon the highest efficiency by labor, if the present high wages and general prosperity is to be maintained.

Importance of Management

The electragist must take the initiative on behalf of himself and his men to obtain maximum production, or else face a serious readjustment period; because prosperity cannot be indefinitely maintained with good wages, unless production is also maintained. Outside of tools and machines used to increase output no more important factor in job management is the foreman. This pivotal man must be given the greatest thought for remember he is spending your dollars not for something definitely stocked, but for a product that may expand in value or shrink to an unbelievable degree. Stop for a moment and think of his responsibilities—a director of human endeavor, a manager of personalities, an organizer, requiring sympathetic understanding, impartiality, forcefulness and loyalty, oftentimes facing insidious penetration by radical elements, experiencing at times the oddest whims of the human mind that must be carefully handled. Then there are the idiosyncracies of your clients that must be understood and dealt with and lastly perhaps yourself to whom he has to attune himself.

Almost invariably the efforts in assisting foremen to improve and grow more capable will be passed on to the men under him for mutual benefit.

While on the subject of foremanship it might not be amiss to mention that a man's ability to function efficiently is dependent upon the type of direction he receives and it therefore behooves those directing foremen to study their own actions and their effects, for here too is a factor in job management that can, when poorly done, exact its toll.

Training

The problem of fitting the foreman to the job is worthy of serious consideration and to do this many factors must be considered, for undoubtedly different classes of work oftentimes require foremen of peculiar temperament and training. Although it is not always possible to select a man of the right experience for a particular class of work, if your foreman's temperaments are understood, one may be selected whose aptness for the work will permit him to grasp the fundamental details quickly and with proper help and direction, soon become proficient. At such times there is added to the construction force another unit more broadly experienced, and ready to carry on should expanding work require it.

The foreman's ability must be directed in discerning channels so that he too selects men under him for the work that they are best suited and the foreman can often be greatly assisted in this direction by openminded discussion with his superiors.

In job management, favoritism is fatal and lasting efficiency can only be maintained by honest recognition of those who produce results and quick elimination of the laggard, regardless.

One factor in job management of great importance in respect to labor costs is the necessity of planning work so that the men may be kept on the one operation with which they have become familiar, as long as possible, and not be moved from one piece of work to another. Moving about will not permit the best labor efficiency and, outside of the lost time in starting a number of small jobs, the ability to determine a man's accomplishments is lost while the psychological effect often creates indifference towards his work.

Specialized training and use of men is receiving more and more attention. Keen foremen quickly detect each man's peculiar capabilities and endeavor to take advantage of them. Physical characteristics oftentimes play their part. For instance, big pipe men almost invariably are inclined to robustness, for this class of work is wearing on the man of lighter frame. Perhaps

(*Continued on Page* 32)

Once there was a contractor,
And he was wondrous wise;
He got himself a school-house job
And lost his shirt and ties!
He jumped into another one
And tried to make it pay,
The business went so very low—
There's nothing more to say!

Who Said Business Is Bad?

JOHN MARTIN carried out the last extension and hurried over to the adding machine. He was short of help and all the labor in connection with this estimate had been done with his own hands. But then, John Martin was often forced to let his estimators go, and although his task of picking off outlets was a tedious one, it had been done with the experience of years of practice.

His bid was due at eleven and it was now ten-fifteen. He needed the job badly, and as the figures at the bottom gained and approached twenty thousand, his eyes showed more and more concern. If he could only land the job, how he could cut those feeder sizes! A thousand dollars at least. The engineer was a fool! Too many outlets—and that crazy idea of putting all those plugs around. Galvanized conduit—but he could switch that to black. There were possibilities in the estimate, and as the last total was made, Martin moved again to his table.

Twenty-two thousand was his raw cost and he needed the work. Edsel Stein was bidding and Stein had a lot of pull with the city. Stein would also see the possibility of cutting down the feeders. Would he discount his bid anticipating the change? Egan too had taken out a set of plans, and Egan was always a dangerous bidder.

True, there was an agreement in a way, each was pledged to add a reasonable overhead and profit, but Martin felt that he must win.

"If I only knew what those other birds would do," he muttered, moving his fingers nervously through his gray hair. "I'd like to put on ten percent, but I gotta get the job. Maybe five will take it. But then Egan is hungry, he'll shoot the limit and I'll bet a dollar that Quality Products Co., have given him a better price on the panels and switchboards."

It was a moment of hesitation, and then his slightly shaking hand took up the bid form and he printed in the figures—Twenty-one thousand seven hundred and seventy-seven dollars.

The price was $200 below his cost but Martin had to receive the award.

A telephone at his side rang loudly. As he listened his scowl deepened. "I'm sorry, Mr. Martin is not in just now," his voice was as unnatural as he could make it. "I'll have him call when he returns." Another credit man stalled. This fellow was persistent—calling up when he was making up a bid. His first payment on this new work would be good. He smiled thinking how he would bawl those jobbers out when he paid them. He was hard pressed for money now, but wait till he got this good job.

He called his clerk and gave him the proposal with instructions to stay for the opening, then leaned back in his chair.

The plans called for feeders of six hundred thousand—four hundred thousand was all that was necessary. If he used varnish cambric he could cut that to 4/0. The possibilities were great!

"Hello, John, you don't look so busy." Thomas Egan threw his hat on the table, and Martin quickly covered up his estimate.

"Didja put a figure on the school today, Tom?" Martin tried to ask his question in a casual voice.

"Yes, I stuck in a figure but it won't be any good. I don't like those damn school jobs. The last one I had they wouldn't give me a single break. Wanted what was specified. Did you bid?"

"Well, I made up a price but I don't think I've got a prayer either. This overhead and profit stuff is all right but you know damn well Stein won't put on what we agreed, and I don't trust Remington either. He needs a job bad and I understand there's only one supply house that will give him any credit. It's a rotten—"

The door opened before Martin could finish his remark and Edsel Stein, closely followed by Clyde Remington pushed in. The greetings exchanged were cordial. It would be impossible for anyone to detect the least bitterness or distrust among them. The reason perhaps was, that each of these men had no personal animosity. The electrical business had made them all sink to the lowest level. Their pride and honesty had suffered under its ruthless handling.

"Well, Martin, you are chairman of this committee. What have we got on today? I've got a date at twelve, so let's make it snappy."

"We're supposed to decide what we are going to do about those damn jobbers selling our customers. If you are all agreed I recommend that we bring in a report that the next one we find selling a customer gets cut off all our lists. Oh! I know that some of our own gang will try to buck, but we have ways of handling that." Martin wanted to get the meeting over. The bids must have been opened and he wished to hear the result.

"Well, that suits me." It was Clyde Remington speaking. "This jobber situation doesn't worry me as much as the general contractors. I think those fellows are responsible for over half of our troubles. Do you remember that bid on the Sugar Biscuit plant? I was low by five hundred dollars. I had a price of ninety-five hundred and the nearest figure was over ten thousand. None of you men bid, so I don't mind

giving you the dope. Well, the General Contract & Engineering Co. got the job,—so I blew in this morning and they said they would give me the work for nine thousand—that they had an out of town figure at that, but they would rather see me have the business. Of all the dirty jips. I think we all ought to quit figuring with them."

Any discussion of Remington's troubles was cut off by the entrance of the clerk. He was most excited and undoubtedly felt that the news he bore was of great enough importance to command the hearing of his employer at once.

"Mr. Martin, sir—we were low on that job, yes sir, awful low—the next man to us was thirty-one thousand." He gasped the news to his open-mouthed boss. "And the gang around the City Hall said we muster forgot the ten thousand dollar fixture allowance."

John Martin received the congratulations of the committee as they departed. He had lied, without conviction, and assured them that he had included the allowance. But he knew that his acting had been poor.

Ten thousand dollars sunk—and his nearest competitor, Egan, had made a bid of thirty-one thousand. His most violent anger was directed at his friends on the late committee.

"Dirty rats, if I'd put in that ten thousand they would have beat me out, and they were the lily-white angels that all added on their overhead and a fair profit."

He reached for the 'phone and gave a number. "General Contract and Engineering Co.? This is John Martin; say, I just made up a bid on that Sugar Biscuit job. Well, I'll do the work for nine thousand two hundred." They had offered the business to Remington at nine thousand, they might go two hundred more. "What! eighty-five hundred—who's quoting such a rotten price? Clyde Remington—the low-livered skunk. All right, I'll take it at that." Martin hung up the receiver and smiled. Two jobs in one day!

Who said business was bad?

—(Read at the testimonial dinner to A. C. Brueckmann, Baltimore, Md., December 29, 1927.)

Job Management

(*Continued from Page* 30)

the big pipe man by his very nature does not produce effectively on the lighter work of pulling wire, or the setting of switches, receptacles and the like, where the chief asset is nimbleness.

Specialization

On branch circuit conduit work certain men develop an efficiency that is remarkable and without apparent extra exertion accomplish 100 percent more than their fellow mechanics. There is the switchboard specialist capable of handling bare copper bus bars with the same ease that the other men handle conduit. This class of work requires painstaking care and exactness is the prime essential. Is it any wonder then that this type of man fails to produce on the rougher classes of work in which quantity production is the main requisite? Low tension work also draws to it men of peculiar temperament, attracted by the very character of the work. So it is with jobbingmen who have knack of getting along with the women folks.

The old saw—"A shoemaker to his last"—is more and more applicable to the various divisions of the modern industry and it is the foreman with ability to discern his men's peculiar adeptness for certain classes of work and uses them accordingly who produces the greatest results for each dollar expended.

In the handling of a large operation, records are an important factor in job management, and various forms of stationery may be prepared to greatly assist in the work. The ordering, requisitioning and routing of materials and the accounting for labor expended are necessary, not only as a matter of record for billing and adjustment purposes, but more especially for the purpose of keeping a definite check on all operations.

It may not be thoroughly appreciated that manufacturers' and suppliers' catalogs are a great asset to the foreman and it is the electragist's duty to see that each man in charge of work is supplied with a complete library. These catalogs are easily obtainable on request and there seems to be no excuse but indifference if they are not made available for the foreman. Many catalogs contain a great fund of information such as tables, data and practical charts. In one case even the complete "National Electrical Code" is printed within its pages.

The National Electrical Code is a booklet that should be placed in the hands of every foreman and he should be encouraged to study its various provisions. This also applies to local electrical codes or ordinances. Knowledge of the rules make for greater effectiveness and frequently avoids expensive changes due to violations, not to mention the ill will engendered by controversial discussions that may be avoided if a proper understanding of the rules are obtained.

Codes should also be supplied to mechanics and apprentices and, in particular reference to the training of the latter, it is heartily recommended that apprenticeship committees and commissions place this book in the curriculum of their studies.

Job management is a complex study, involving many factors and the more complete is each electragist's knowledge of his business, the more stable the industry will be as a whole.

What Leagues Can Do

Experience of six and a half years has indicated to the Electrical League of Colorado that a league can do the best work along the following lines:

1—Serving the public as a bureau of electrical information — a consulting service without charge.

2—The maintenance of a staff to work directly with architects, builders, owners, and others in advising on electrical installations in all types of buildings.

3—To work toward the continual improvement and enforcement of electric wiring rules.

4—To explain, demonstrate and emphasize the necessity and value of proper lighting.

5—The encouragement and co-ordination of electrical exhibits.

6—The establishment of electrical homes in the most advantageous places.

7—The development of team-work throughout the industry by get-together meetings and other social activities.

8—The establishment of a consciousness in the mind of every electrical man in the community that he cannot be an ardent electrical advocate until he himself practices the precepts of the industry.

Estimating Methods---X

Labor Cost Records
Panelboards
Feeder Taps
Boxes
Wire and Devices
Cabinets

By ARTHUR L. ABBOTT
Technical Director, Association of Electragists, International

WHEN the work on a large job proceeds in an orderly manner it is possible to keep rough records of the total roughing-in labor on certain floors which will have some value and will not require any great effort. In making the records on a building of any ordinary type of fireproof construction, when the floor conduit runs are built into the floor slabs, the floor work should always be kept separate from the wall or partition work. This can easily be done because the two classes of work are done at different times. The records will have little value unless this separation is made. Like all other such records, the actual labor must be compared with the standards used for estimating in order that the data secured may have permanent value.

Keeping Records

To keep records merely for the purpose of checking estimating data is to incur an expense which, though worth while in the long run, brings no direct return; the additional overhead expense is incurred with the expectation that better estimating will eventually bring about increased profits. On the other hand, if the labor cost records are so kept that during the progress of the job a weekly check can be made of the actual labor against the estimated labor, it is practically certain that the records will produce a direct and immediate return in the way of increased labor efficiency which will at least balance the cost of the records.

To make this running check on the branch circuit roughing-in, assuming that all floors in the building are to be of the same class of construction, it is first necessary to make up a total for all work in the floors, including branch lighting runs and all low tension systems, and a total for all work in walls. The floor work total will include ceiling outlets and pipe entrances, all conduit in the floor slabs for both lighting and low tension systems, and allowances for the labor involved in turning conduits down or up for extension to wall outlets at a later time. The allowance for "turn downs" is 40 percent of the labor on ½ in. wall pipe entrances, 60 percent to be considered as wall work, and 30 percent for ¾ in. and 1 in. wall entrances, the remaining 70 percent to be included in the wall work.

The total labor on conduit and outlets installed in floors, computed as above stated, is to be divided by the number of ceiling outlets, giving the total time per outlet for all floor work. The remainder of the branch circuit roughing labor is of course wall work and this divided by the total number of outlets of all kinds in the walls give the total time per outlet for the wall work.

Man Report

A daily report is made out by the job foreman showing the manner of the workmen, the time put in by each man on each class of work, and the amount of work completed in each class. (See Form C-1). The wage rates and amounts are filled in in the office.

The amount of work completed is measured by the number of outlets installed. This is far more accurate, takes less time and is more satisfactory generally than to record the number of feet of pipe installed. It is almost absolutely necessary that the outlets installed each day be recorded by checking them off on extra blueprints of the floor plans, these prints being sent to the office every second or third day where the checks are transferred to a master set of plans, and the outlets installed are counted and recorded. A record made in this way is necessarily accurate; no outlets can be omitted and none can be recorded twice.

Daily entries are made on Form C-2 of the outlets installed, the total hours and the total labor cost on this class of work. At the end of each week the totals to date are found for the outlets, hours and wages. For convenience the estimated time and labor cost per outlet are noted in the heading of the form. Once a week the actual time per outlet is computed from the total outlets installed and the total time, and this is compared with the estimated time by finding what percentage the actual time is of the estimated time.

Cost Per Outlet

The actual cost of labor per outlet is also computed for comparison with the estimated cost. The estimated total cost for the work done to date is figured

A. E. I. Form C-1

Job No. 1624 — DAILY TIME AND WORK REPORT — Date Jan. 16, 1928

CONTRACT Allen Building — FOREMAN C. J. Smith

WORKMAN	TIME From	TIME To	Hrs.	Min.	Rate	Amt.	WORK COMPLETED	Class No.	CLASS OF WORK
G. J. Smith	8	4:30	8	1	.50	12	46 Outlets	1	B. C. Floor Work
W. M. Jones	8	4:30	8		.85	680			
John Doe	8	4:30	8	1	.25	10			
R. Roe	8	4:30	8		.85	680			
E. Black	8	1:30	5	1	.25	625			
G. F. White	8	1:30	5		.75	375			
			42			4560			
E. Black	1:30	4:30	3	1	.25	375		26	Move material
G. F. White	1:30	4:30	3		.75	225			
			6			600			

Form C-1

from the estimated cost per outlet and the total outlets installed to date. The difference between the actual total cost and estimated total cost is set down as a saving or loss.

This sheet thus provides a complete comparison between the actual labor and estimated labor, with respect to both time and cost.

Labor data applying to a number of items commonly occurring in wiring installations will be found in Table 8.

The wire data is in the form of hours per 1,000 ft. of single wire or hours per 1,000 ft. of conductor for duplex wire. The time per 1,000 ft. is intended to include the time required for making splices at outlets, which is somewhat variable. As a rule there will be fewer splices in a simple layout and the actual pulling labor will be less, therefore the labor should be figured at a higher rate on the more complex installations.

TABLE 8—BRANCH CIRCUIT WIRE—DEVICES FLOOR OUTLET BOXES

Situation	Hours
Branch Circuit Wire, No. 12 or No. 14	
Per 1000 ft.—Simple layouts	5 to 7
Complex layouts	8 to 10
10 amp. Single-Pole Switch and Plate—per 100	25
10 amp. Double-Pole, 3-point or 4-point Switch and Plate—per 100	40
10 amp. Double-Pole Insertion Receptacle and Plate per 100	25
Drop Cord—reinforced cord—each	0.5
Sign Receptacle in box cover—each	0.35
Watertight Floor Outlet Box in any class of floor construction—each	1.4

Labor records on the larger class of installations indicate that 1/4 hour each must be allowed for single-pole switches and insertion receptacles. This work is often done in much less time in small residences and in apartments where on account of the small number of units an increased time per unit would naturally be expected.

Floor outlet boxes were not included in the previous tables because there is no data available which shows any definite variation in labor dependent upon the class of floor construction. Pipe entrances to floor outlet boxes should be figured the same as pipe entrances to ceiling outlets. Floor boxes are usually made with threaded openings and the pipe entrance labor will actually be more than for a locknut and bushing attachment, but for the sake of simplicity it is usually better to neglect this difference.

Form C-2 A.E.I. 4-6-27

LABOR COST RECORD SYSTEM BRANCH CIRCUIT CONDUIT AND BOXES SHEET NO. 1

CONTRACT Allen Building JOB NO. 1624 FROM Jan. 10th, 1928 TO Jan. 28th, 1928

CONCEALED WORK IN FLOORS,

6th & 7th FLOORS. FLOOR CONSTRUCTION Class A1 WALL CONSTRUCTION ______ OUTLETS IN FLOOR 2146 WALL ______ SUSPENDED CEILING ______ CONCRETE COLUMN ______

FOR ALL WORK OF THIS CLASS—ESTIMATED TIME—TOTAL 3435 HOURS. PER OUTLET 1.6 HOURS. ESTIMATED COST, TOTAL $ 3647.00 PER OUTLET $ 1.79

Date		Outlets Installed: This Date	Outlets Installed: Total to Date	Time in Hours: This Date	Time in Hours, on Work Completed to Date: Total to Date	Hours per Outlet	Per Cent of Estimated Hours	Cost in Dollars: This Date	Cost in Dollars, on Work Completed to Date: Total to Date	Cost per Outlet	Estimated Total Cost	Saving	Loss
Jan.	10	0		10				21 00					
	11	14		28				30 10					
	12	21		32				34 80					
	13	17		35				59 40					
	14	9	61	20	125	2 05	128	22 40	167 70	2 75	109 00		58 70
	16	21		42				45 60					
	17	26		48				51 60					
	18	20		48				51 60					
	19	37		48				51 60					
	20	29		40				43 60					
	21	17	211	24	375	1 78	111	25 80	437 50	2 07	378 00		59 50
	23	22		40				43 60					
	24	32		48				51 60					
	25	31		42				45 60					
	26	21		32				33 60					
	27	35		48				51 60					
	28	12	364	20	605	1 66	104	21 80	685 30	1 88	652 00		33 30

Form C-2

Panelboards are always installed in cabinets but cabinets and other boxes are frequently installed for purposes other than to contain panelboards. The panelboard labor may therefore be combined with the cabinet labor, and the data is most convenient for use in this form, but additional data must be provided for cabinets and other boxes without panelboards.

The estimator knows the number and capacity in amperes of the panelboard terminals for connection to wires and cables, but he has no further information as to size or weight. The labor must therefore be based on the number and size of the terminals. Table 9 gives the panelboard and cabinet labor for terminals of the common sizes and from this data an estimate may easily be made of the labor to install any panel and cabinet, of either standard or special design.

As an example of the use of this data, assume a three-phase panelboard having 10 branch circuits, four 60 amp., four 100 amp., and two 200 amp. the mains having a capacity of 400 amp. Each branch circuit has three terminals and there are three terminals for the mains. The labor is figured thus:

PROBLEM 1

Terminals	Hours each	Extension
12— 60 amp.	.55	6.60
12—100 amp.	.78	9.36
6—200 amp.	1.13	6.78
3—400 amp.	1.63	4.89
	Total hours....	..... 27.63

This is the total estimated time to install the cabinet, mount the panelboard, make all connections and install the cabinet trim.

The labor to install a cabinet and standard 24-circuit lighting panelboard having 3-wire mains is estimated as follows:

PROBLEM 2

Terminals	Hours each	Extension
48— 30 amp.	.27	12.96
3—100 amp.	.78	2.34
	Total hours....	..... 15.30

It makes no difference whether the panelboard has two fuses per circuit or only one; in either case there are two wires to be connected per circuit.

Standard lighting panelboards have either 2-wire mains for use on a 110 volt system or 3-wire mains for use on a 110/220 volt system. For a given number of branch circuits there will be two main terminals in one case and three main terminals of smaller size in the other case, and the labor allowance for the main terminals as per the table is about the same either way. Table 10 has been made up from the data in Table 9 and may be used for panels having either 2-wire or 3-wire mains.

The labor required for mounting a cabinet or a panelboard, that is, for placing the device in position and securing it in this position, will naturally depend upon the weight to be handled. If a panelboard has switches in the branches or a main switch both the panel and cabinet will be larger and

heavier than in case there are no switches, and hence the mounting labor will be increased. It is not considered practicable however to take this difference into account. The connecting labor is of course the same in either case and as a practical method it is considered best to use the tabulated data in all cases regardless of whether the panelboards have switches or not.

Feeder Taps

A feeder or subfeeder often supplies only a single panelboard, the ends of the conductors being connected directly to the panelboard lugs. It is also common practice to supply two or more panelboards from one feeder or subfeeder. In this case the panel may be provided with "through feed" mains and the feeder is cut and connected to each end of the mains on the panel, and there are additional terminals which take the standard labor allowance. This construction is quite unusual however, it being the more common practice to carry the feeder through the wire gutter and tap these conductors in order to make connections to the panelboard. It is evident that making these taps is an additional labor item. Table 11 gives the hours each for taps of any size to mains of any size when the taps are made by wrapping the strands of the tap conductor around the main and then soldering the assembly. Records on one installation showed a saving of 40 percent of this labor by the use of solderless connectors.

It should be remembered that there are usually only two, three or four of these taps to be made at one cabinet. The time per tap is considerably less when a large number of taps are to be made at one location, as for example at an assembly of meters in an apartment house.

There is frequent need for labor data applying to the boxes and cabinets installed for various uses other than to contain panelboards, such as pull boxes, conductor support boxes, boxes to contain various kinds of equipment, and telephone cabinets. The data in Table 12 is for general use in estimating new building work where it is not practicable to determine the particular conditions under which each box will be installed. If a box has a removable trim, the latter is usually installed as a separate operation and the time required will be slightly greater than for a box with door attached.

In using tabulated data for the installation labor on any kind of apparatus, it should always be kept in mind that such data can only be based on averages; that in any such operation there is always some time spent in preparing to do the work and getting to the work and this time is variable. The consequence is that one single operation may require much more or less time than the average. A reasonable time allowance may be exceeded

TABLE 9—Panelboards and Cabinets

Size Terminal Amperes	Hours per Terminal
30	.27
60	.55
100	.78
200	1.13
400	1.63
600	2.62

TABLE 10—Standard Lighting Panelboards and Cabinets

This table which is calculated from the data in Table 9 gives the total hours per panelboard for standard lighting panelboards and cabinets. Standard panelboards are made with either two-wire or three-wire mains up to and including 32 circuits, and with three-wire mains only up to and including 60 circuits. The table may be used for panelboards having fuses only or both fuses and switches in the branches, and having mains with lugs only, main fuses, main switch, or main switch and fuses.

No. of 30 amp. 2-wire branch circuits	Hours Panelboard and Cabinet	No. of 30 amp. 2-wire branch circuits	Hours Panelboard and Cabinet
4	3.3	36	23
6	5	38	24
8	6	40	25
10	7	42	26
12	9	44	27
14	10	46	28
16	11	48	29
18	12	50	30
20	13	52	31
22	14	54	32
24	15	56	33
26	16	58	34
28	17	60	35
30	18		
32	19		
34	22		

TABLE 11—Making Wrapped and Soldered Feeder Taps
Hours per tap

Size Tap	Size Main: No. 8 to No. 2 Hours	No. 1 to No. 3/0 Hours	No. 4/0 to 300,000 Hours	400,000 to 600,000 Hours	700,000 to 1,000,000 Hours
No. 8	.45	.50	.65	.8	.97
No. 6–No. 4	.70	.75	.85	1.0	1.2
No. 3	.78	.83	.95	1.1	1.3
No. 2–No. 1	1.00	1.10	1.23	1.4	1.55
No. 0–No. 2/0–No. 3/0		1.25	1.35	1.5	1.67
No. 4/0 to 250,000			1.90	2.1	2.2
300,000 to 400,000			2.00	2.2	2.4
500,000 to 600,000				3.1	3.3

Note:—It is assumed that the size of tap is never larger than the size of the main cable.

TABLE 12—Hours of Labor Mounting Cabinets and Boxes

Area of Back Sq. Ft.	Box With Hinged Door	Box or Cabinet With Removable Trim
2 or less	.8	1.0
3	1.0	1.2
4	1.2	1.3
5	1.5	1.6
6	1.6	1.8
8	2.2	2.5
10	2.5	2.9
12	2.8	3.6
14	3.0	3.8
16	3.3	4.1
18	3.5	4.3
20	3.7	4.5
22	3.8	4.6
24	4.0	4.8

by 100 percent on account of the lack of proper tools, materials and skill.

Pulling in branch circuit wire should be recorded as one operation; the installation of flush switches and receptacles may be considered as one operation if both kinds of devices are installed at the same time and by the same men. If the records are so kept as to have the highest value, i. e., so that a weekly check can be made against the estimate, it is necessary to record the amount of work done each day.

Both small wire and small devices must be kept on the job in a locked room. The workmen must therefore start from this point each morning and return all unused material to the same place when they finish their work. It is a simple matter to use an "in and out" record which will show the quantities of material taken out by a crew and the quantities returned at the end of the day's work. The difference is, of course, the material installed.

Cabinets

In keeping a complete detailed record of all the labor on a job each cabinet should be recorded as a separate operation. If the cabinet is mounted against a wall or column already built, or is mounted on steel angles attached to the steel frame of the building, the cabinet installation is a definite operation and the labor is easily recorded.

When a cabinet is to be built into a tile or brick wall the case is quite different. Assuming that the branch conduit runs have been turned down through the floor above, the cabinet is temporarily braced in position and the conduits extended to it, so that the cabinet is hung on the pipe until the wall is built. Here it is impossible to definitely separate the conduit labor from the cabinet labor and the record should show the total time for mounting the cabinet and stubbing down all the home runs. For comparison with the standard or estimated time, the labor on each conduit may be figured as 60 percent of the time for a wall pipe entrance and the total estimated labor should be computed for the cabinet and all conduits.

The installation of each panelboard involves enough labor so that this may be recorded as a separate item for each panel and this method should be followed. Panelboard installation includes unboxing the panel, moving it to the cabinet, mounting in the cabinet, and making all connections to the panel. Making taps to risers should be recorded as a separate operation.

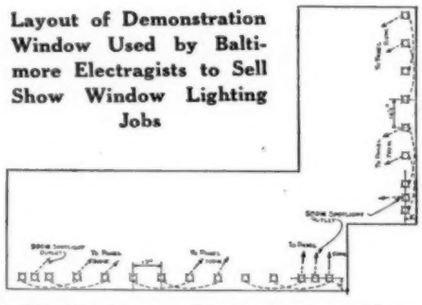
Efficiency in the Filing of Correspondence

John R. Proctor, president of The John R. Proctor Company, electrical contractor of Bayonne, N. J., has worked out a system of filing correspondence that he says has increased the efficiency of his office staff in handling this sort of work.

A special form of internal correspondence paper has been prepared on which are printed the words "Subject," "Location" and "Referring to" at the head of the sheet. When filled in this gives all the information necessary for proper filing and speeds up the work since it eliminates the necessity of looking through a letter to find out just what its subject may be. No formalities whatever are thought necessary either in correspondence between the head office and men in the field.

The filing system itself is worked out on the numeral principle: When a job is received it is given a number at once and everything pertaining to that job contains that number.

Electragists Sell Show Window Jobs by Demonstration



Layout of Demonstration Window Used by Baltimore Electragists to Sell Show Window Lighting Jobs

THE Baltimore Electragists have been successful in selling show window lighting for jobs for members by demonstration in a model installation. When this plan was decided upon a conspicuous local retail store was selected, where the existing window lighting installation was just average, and where the attention of other store managers could be attracted if the model job was a success.

The model layout shown was installed in a local department store under the following conditions:

The Baltimore electragists agreed to make the installation at a specified price and pay for the current used during the demonstration in excess of the normal usage. In the event that the store was not satisfied and pleased with the results of the demonstration the electragists agreed to remove the equipment. Needless to say it was unnecessary to do this, as the store found the well-lighted window very much worth the cost.

Twenty 500-watt reflectors were put in, on 17 in. centers, on one side of the window and on 16½ in. centers on the other side. A total of ten circuits was put in, with 1,000 watts on each. Additional circuits were provided for three 500-watt spotlight outlets.

As soon as the installation was completed, and a display put into the window, tests on the attention creating value of the new light were made. Since the old installation was left in the window, the circuits were so arranged that either the old installation or the new one could be turned on at will.

In making the tests careful arrangements were made so that identical situations would apply when either the old equipment or the new was in operation. The tests, conducted over a period of a week, were run in periods of 15 min. each. First the old lights were on for 15 min., and then the new installation was turned on for 15 min. The alternating tests were kept up for 2 hours at noon, 2 hours during the afternoon, and 2 hours in the evening, every day for a week. Additional tests were made over a period of 2 hours on Sunday and 2 hours during a rain.

A careful count was made of the number of passersby who stopped to look at the window during the 15 min. periods of the tests. The average, over the entire week, for all tests, was an increase of 89 percent. The secretary of the Baltimore Electragists, A. P. Peterson, is now sending sales letters to other stores telling them about the results of the installation of better show window lighting, and it is hoped that a large number of new jobs will result.

Advertising the Red Seal Contractor

How Red Seal Leagues Give the Contractor a Definite Place in the Red Seal Advertising Program

THE electrical contractor is a definite part of the Red Seal picture, as many leagues realize, and they are tying in the Red Seal contractor in their newspaper advertising, bill board signs, booklets, etc. Helping to build the reputation of his dealers is part of the merchandising job of the modern successful manufacturer. In this case the retail outlet for the Red Seal plan is the electrical contractor, and the leagues help to build reputation for Red Seal contractors by including them in the advertising.

Newspaper Advertising

In Birmingham, Ala., the electrical contractor who secures the largest number of Red Seal jobs during the month is given an individual newspaper advertisement, showing a home he has wired and listing the name of the contractor who made the installation. The selection of the home to be run is left entirely to the contractor so that if he desires he may use this as a method of securing new business from speculative builders. About once a month the Alabama Electrical League runs an advertisement listing the electrical contractor members who do Red Seal wiring. In addition, when an advertisement is run for a builder announcing a new Red Seal home for sale, the electrical contractor's name appears with a picture of the house.

Direct mail efforts on Red Seal wiring, including a list of Red Seal contractors, are sent out by the Electrical League of the Tri-Cities to every person who takes out a building permit. This league, which operates on a rather small budget, has little money to spend exclusively on Red Seal, and it was felt that the most success would be obtained from the money if it was spent on direct sales letters. A letter is sent out with the booklet listing the Red Seal contractors.

Although the league in Savannah, Ga., has abandoned newspaper advertising, it still has a method of giving publicity to the Red Seal contractors. This is done by printing a card listing Red Seal contractors on one side and members of the league on the other. These cards are supplied to the central station, the contractors, and the electrical inspector who hand them out to any who inquire about wiring.

In Omaha the league is just starting on its Red Seal activity, with a plan to carry the names of contractors and architects in its Red Seal advertising.

Sign Boards

Sign boards about 8 ft. by 5 ft., which are reproductions of the Red Seal poster, are used in Syracuse to advertise newly constructed Red Seal homes. These boards are moved from one job to another, changing the address, date and electrical contractor's name each time. Sometimes the league floodlights the house at night, with especially bright lights on the Red Seal sign board. Newspaper advertisements feature a single new Red Seal home, with the name of the electrical contractor and the builder prominently displayed.

An exceptionally complete and attractive booklet on the Red Seal home has been prepared by the Syracuse Electric League, in which electrical contractors who do Red Seal wiring are listed. It is a 25-page, 2-color booklet entitled "The Modern Applianced Red Seal Home," which is distributed to home owners, builders, etc. The feature of the booklet is the complete description of the league's model Red Seal home, room by room, with the value of many well-located convenience outlets subtly put into the copy. To make the booklet even more interesting to housewives and prospective home-building women, a number of recipes for cooking on electric toasters, percolators, electric ovens, etc., are given. A complete floor plan of the first and second floors is shown, with the outlets indicated. To complete the story a list is printed of the contractor-dealers who belong to the Syracuse Electric League, with a star before those who have wired one or more Red Seal homes.

Lack of money, according to Frank H. Matson, secretary of the league in St. Paul, Minn., is the only reason why the contractors of this territory are not advertised. Future plans call for more of this type of advertising, with the Red Seal contractor prominently mentioned.

The Electrical Service League of British Columbia has a less public method of building the Red Seal contractors' reputation. The contractors are not advertised, but their names are sent to builders and a list is kept on file in the office of the league. Letters and advertisements directed to the home owner explain that a list of Red Seal contractors is available for inspection.

Members of the Electrical League of Nashville who wired Red Seal homes are carried in all the league's advertising.

Publicity

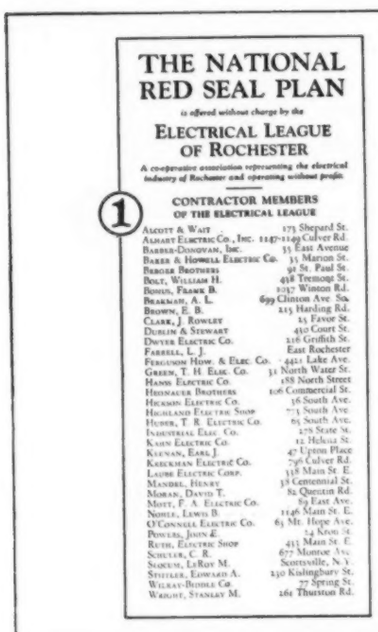
Free publicity for Red Seal contractors in the Sunday morning edition of a local newspaper is the help given by the Washington, D. C., league. This newspaper runs a Sunday column of "Electric League Briefs" which are written by N. H. Barnes, secretary, and in this section every contractor who does a Red Seal job is mentioned. This league also has a printed list of contractor members of the league which is given by the central station to prospects inquiring about wiring.

The Milwaukee Electric League has begun a newspaper advertising campaign giving publicity to the contractors, builders and architects who produce Red Seal homes. A series of advertisements are appearing, each featuring one house which has been awarded a Red Seal, and listing the electrical contractor who did the wiring.

Promotion Campaign

Rochester has a complete program enlisting the cooperation of the electrical contractor and builder in an advertising and promotion campaign. On the last Sunday of each month the Rochester League runs an advertisement listing all Red Seal houses constructed during the month, with the location of the houses, the builders' names, and the electrical contractors who wired them.

In order to make sure that no contractors will be omitted a double postal reply card is sent once a month requesting the addresses of any Red Seal



THE NATIONAL RED SEAL PLAN

is offered without charge by the

ELECTRICAL LEAGUE OF ROCHESTER

A co-operative association representing the electrical industry of Rochester and operating without profit.

CONTRACTOR MEMBERS OF THE ELECTRICAL LEAGUE

Alcott & Wait	173 Shepard St.
Almart Electric Co., Inc.	1147-1149 Culver Rd.
Barber-Dodgvan, Inc.	35 East Avenue
Baker & Howells Electric Co.	35 Marion St.
Berger Brothers	92 St. Paul St.
Bolt, William H.	458 Tremont St.
Bonus, Frank B.	1037 Winton Rd.
Brakman, A. L.	699 Clinton Ave. So.
Brown, E. B.	215 Harding Rd.
Clark, J. Rowley	15 Favor St.
Dublin & Stewart	410 Court St.
Dwyer Electric Co.	216 Griffith St.
Farrell, L. J.	East Rochester
Ferguson Hdw. & Elec. Co.	442 Lake Ave.
Green, T. H. Elec. Co.	31 North Water St.
Hann Electric Co.	188 North Street
Heinauer Brothers	106 Commercial St.
Hickmon Electric Co.	36 South Ave.
Highland Electric Shop	771 South Ave.
Huber, T. R. Electric Co.	65 South Ave.
Industrial Elec. Co.	276 State St.
Kahn Electric Co.	12 Hekill St.
Keenan, Earl J.	47 Upton Place
Kreckman Electric Co.	756 Culver Rd.
Laube Electric Corp.	318 Main St. E.
Mandel, Henry	35 Centennial St.
Moran, David T.	82 Quentin Rd.
Mott, P. A. Electric Co.	69 East Ave.
Nottle, Lewis B.	1146 Main St. E.
O'Connell Electric Co.	63 Mt. Hope Ave.
Powers, John E.	54 Avon St.
Ruth, Electric Shop	411 Main St. E.
Schuler, C. R.	677 Monroe Ave.
Slocum, LeRoy M.	Scottsville, N. Y.
Stiteler, Edward A.	230 Kishpaugh St.
Wilkay-Dodge Co.	77 Spring St.
Wright, Stanley M.	161 Thurston Rd.

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RED SEAL HOMES

5700, 5704, 5708 Paseo

Architect	Built by	Wired by
C. M. Williams	Thos. S. Dennis	L. D. Ward

By having these three beautiful, modern duplexes wired as Red Seal Homes. Mr. Dennis can assure whoever buys or rents them of proper home lighting and the convenient use of electrical service. As an additional measure of service, Mr. Dennis has installed electrical refrigeration.

The Symbol of Adequate Wiring C. 1924 S. E. D.

THE KANSAS CITY ELECTRIC CLUB

921 Walnut St. Harrison 5769

2

3

Nobody Wants a Poorly Wired House

YOU can't hide bad and inadequate wiring. Now you are offered the services of a graduate electrical engineer who will advise with you and your architect about adequately wiring your home for all Electrical Conveniences. This is ABSOLUTELY FREE.

The Symbol of Adequate Wiring

The Red Seal Plan

Nashville is just one of 100 cities using the Red Seal Plan as a guarantee that your home shall be perfectly wired for electricity. When the job is completed the Red Seal is stamped there—guaranteeing your home and increasing its value.

Ask for the Free Services of Our Electrical Engineer

Just Call Mr. Tathwell, 6-1380
No Obligation.

Here are the members of the ELECTRICAL LEAGUE of Nashville who will wire your house in accordance with the high standards of Red Seal Plan:

ELECTRICAL CONTRACTORS

Buchanan Electric Co.	P. H. Davis & Son
Cunningham Electric Co.	Dendrick & Davis
Edwards Electric Co.	Electric Equipment Co.
Friedman Electric Co.	Fulcher Brothers
Ed and Jim Grewar	Herbrick & Lawrence
Nicholson Electric Co.	O. K. Electric Co.
L. S. Ritter	Roberts Electric Co.
Scalf Brothers	Short-Reid Electric Co.
Woodroof Electric Co.	Wilford H. Wood Co.

MANUFACTURERS

Westinghouse Electric and Mfg. Co.
General Electric Co.

WHOLESALERS

Braid Electric Co.
Graybar Electric Co.
Wesco Supply Co.

ELECTRIC LIGHT & POWER CO.

Nashville Railway & Light Co.

The Electrical League of Nashville

Guided for the Development of Service Rendered the Public by the Electrical Industry.

F. H. TATHWELL, Manager
Telephone 6-1380

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Dollars for Landlords in RED SEAL Wiring

Put In Those Electrical Conveniences

—Have plenty of places to "plug in" your lamps, electric refrigerators, ranges, fans and the score or more electric labor-saving household devices in use today. Anticipate your future electrical requirements, so your house will increase in value as electrical utilities increase.

—Hundreds of Birmingham families are saving themselves the worry of planning the details of their house-wiring plan, by simply specifying the wiring to be in accordance with THE RED SEAL PLAN. Phone them

Contractor-Dealers

Alabama Supply Company	821 North 20th Street
Bagby Elevator & Electric Co.	121 South 20th Street
Bethune-DuRamus Electric Co.	2702 17th Avenue, N.
Braun's Lighthouse	2023 First Avenue, South
J. R. Boggs	1914 Avenue E, Ensley
Electrical Engineering Co.	212 Martin Building
Hale & Hume	410 North 22nd Street
Knight Electric Co.	2023 4th Avenue, North
Chas. Lamar	4207 Sycamore Street
Middlebrooks Electric Co.	412 North 19th Street
Mill & Mine Construction Co.	American Trust Building
O'Keefe & Lyons Elec. Co.	1703 8th Avenue, North
Neal Electric Co.	3600 19th St., Bessemer
Harry Roberts	110 67th Place, North
Smith-Dahl, Inc.	2228 Fifth Ave., North
Sturdivant-Rush Elec. Co.	1819 3rd Ave., Bessemer
Geo. J. Tragresser	1909 Avenue E, Ensley
Walker Electric Co.	3017 4th Avenue, North
Whisler Electric Co.	413 North 19th Street
Whitehead, C. A.	1800 N. 20th Street
Wilcox Electric Company	3017 1st Avenue, North
Simpson Electric Co.	128 19th Street, Bessemer

Alabama Electrical League

A non-profit organization engaged in the development and improvement of the services rendered the public by the electrical industry.

Room 808, Birmingham Electric Bldg. Phone 3-9934

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1—The Electrical League of Rochester lists its Red Seal contractors in a Red Seal pamphlet.

2—The Kansas City Electric Club advertises the Red Seal contractor, the builder, and the architect.

3—The Syracuse Electric League advertises the Red Seal contractor on a signboard where new Red Seal homes are being built.

4—Alabama advertises all the Red Seal contractors.

5—One of Milwaukee's advertisements which includes the Red Seal contractor.

6—The Nashville League lists its Red Seal contractors.

No. 1 of a Series Showing Milwaukee's Red Seal Homes.

"Red Seal"

The stamp of approval of the Electrical Industry, is attached to every Red Seal Home. It "Trade Marks" the wiring installation. Call us about our free wiring service.

Home of Jos. A. Starch 817 16th Street Starch Brothers, Builders. Wired by A. Gumm

ELECTRICAL LEAGUE 418 Carpenter Building

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jobs which the electrical contractor has done during the month and which he would like listed in the advertisement.

The Rochester League has a booklet describing the Red Seal plan in an interesting and readable way, with cuts showing the convenience of a well wired home, and it also distributes blotters on which is printed: "The Home YOU Build Deserves Good Wiring, Ask Your Electrical Contractor or the Electrical League about the Red Seal Plan."

Finally, the League operates a bill board sign in conjunction with real estate dealers in a fast-growing subdivision, which advertises the Red Seal plan, the electrical contractor, the builder and the development.

The contractor's legal position in a cost plus contract is worthy of study by anyone who doesn't want to lose money on this kind of contract. The courts have made several helpful decisions, discussed here.

The Legal Effect of Cost Plus Contracts

By LEO T. PARKER,
Attorney at Law, Cincinnati, Ohio

GENERALLY speaking, the legal interpretation of a "cost plus" contract is dependent upon the intended meaning of the parties. However, as the details of the agreement seldom are included in the provisions of the contract considerable litigation has occurred as a result of disagreements between owners and contractors relative to the items that may be legally included in the cost of performing work.

In the case of Show v. Beaumont Company, 102 Atl. 151, it was disclosed that a contract provided in part that a contractor was "to receive for his entire compensation for his services a sum equal to 10 percent of the entire cost of such building."

In this case the court refused to permit the contractor to include in the expenses the salary of the office employees, telephone, stationery, postage, or tools.

Must Furnish Tools

This court in effect said that a contracting company cannot legally charge the owner with a proportion of the salaries that it pays its officers for supervising or superintending the work. The court said: "The contracting company has a right to employ whosoever it chose to superintend the building on its part. . . . So with other items, such as telephone calls . . . they were office charges . . . they were not costs and expenses of the building. So the tools used in the construction were a part of the equipment of the contractor. A contractor, when he agrees to build, must in the absence of a contrary agreement furnish all the tools and necessary appliances for the work contracted to be done."

Sometimes litigation results where a contractor agrees to make certain articles or fixtures on a basis of the cost plus a specified percent. This phase of the law was considered by the court in the case of Lytle, Campbell & Co. v Somers, Fitlet & Todd Co., 135 Atl. 117, decided recently by the Supreme Court of Pennsylvania. The facts of this case show that a contractor entered into a contract to do work and make certain articles required in a building. He was to receive remuneration on the cost plus plan and agreed to furnish certain machines with their operators.

Features of a Cost Plus Contract

1—Contractor must furnish the tools without cost.

2—Depreciation of machines and tools is not a cost.

3—Actual cost, not estimated cost, is the basis.

4—Cost includes overhead.

5—Compensation of injured employees is part of cost.

6—Unreasonable costs are not allowed.

The owner refused to pay the contractor $4,294 claimed as depreciation on machinery on the grounds that this item was not included in a "cost plus" contract unless the same was specifically mentioned.

Items Included in Cost

The court held the contractor not entitled to recover the amount, and in explaining the law on the subject said:

"Appellee 'contractor' is entitled to be remunerated for the wages paid to the operator, the power charges to turn over the machinery, the cost of the materials that went into the manufactured product, which should include the cost of delivering the raw material to the machine and taking it to the appellant's place of business, unless these items are included in other labor charges, and, finally, the charge for the use of the machine itself may be included, but not depreciation or upkeep. . . . Where there is no market value of a finished product it is highly dangerous to work up a cost from a market price per hour for each of the different avenues of effort in making the article, plus cost of materials, which may be more than the actual cost. Actual cost is more certain, and even its ascertainment at times is dangerous. . . . While it may be difficult in some instances to distinguish between operating and overhead, these difficulties must be met and overcome as far as possible. We specifically pointed out items of overhead that could not be allowed as operating expenses. Such are executive or administrative salaries, rents, interest charges, depreciation, taxes and general office expenses."

Actual Cost vs. Estimate

Occasionally controversy develops where a contractor submits an estimate of the cost of installing fixtures and accepts the work on a cost plus plan. Generally the contractor is entitled to recover payment on the basis of the actual cost of doing the work irrespective of the estimated cost.

For instance in the recent case of Johnson v. Kusminsky, 135 Atl. 220, it was disclosed that a contractor entered into an agreement to furnish all material and do the work necessary to make certain alterations in a building. The work was to be done at cost, plus 15 percent.

An architect prepared a sketch on which a verbal contract was based. The contractor estimated the cost, according to the pencil sketch, at from $2,500 to $2,700. As the work progressed numerous changes were made at the direction of the owner and architect.

The contractor sued to recover payment of $3,862, on the basis of 15 percent, above the estimated cost of the work. The court held the contractor entitled to recover the amount.

In Hoggson Bros. v. Speekerman, 161 N. Y. S. 930, it was disclosed that a firm of contractors submitted an estimate for work which amounted to $32,000. The important paragraphs of the estimate are as follows:

"We further agree if on completion of the contract we find that the cost to us, plus 10 percent, is less than the sum named above, to credit the difference on the contract price.

"It is understood and agreed that payments shall be made as the work progresses, to within 10 percent of the work actually completed at the building, and of work completed elsewhere and ready to install, the request for which, if required, shall be accompanied by an insurance policy and bill of sale. . . . It is understood that if, after your acceptance of the same, we find by our regular computation of the cost to us on the completion of the work that our profit above cost so determined is in excess of the percentage agreed to as a limit, we will allow you a credit of each excess in reduction of the amount named above."

Overhead Charges

The cost of completing the work did not amount to $32,000, and the owner refused to settle with the contractors on the basis of 10 percent allowance for the overhead charges consisting of office rent, telephone charges, salary of the offices employees, etc.

The contractors instituted legal proceedings to recover this amount. The court held the contractors entitled to receive payment on the basis of 10 percent of the total of performing the work, including the proportionate part of the overhead charges and the general cost of doing the work. This court said:

"The plaintiff (contractor) claims that the expenses were so understood by both parties to mean a due proportion of overhead charges in addition to the amounts paid for such services and material. We think the latter construction is right, and obviously so. The real cost to plaintiff (contractor) of doing the work, in the nature of things, would not be ascertained unless some part of the ordinary charges of maintaining its establishment for carrying on their business was given consideration. . . . By the terms of the contract the plaintiff was to have a profit of 10 percent. If it was to get only 10 percent of the amount paid for material and labor its profit might be materially reduced, if not eaten up entirely by proportional overhead charges. Such a result was not contemplated by either party. It was intended that plaintiff (contractor) should have a real profit, not a mere chance of a profit."

It is, therefore, quite apparent that the words in a contract may affect the payment received by a contractor.

Employees Injury Compensation

It is important to observe that in 216 N. Y. 697, the court expressed itself as willing to allow 10 percent on the amount paid by a contractor to an employee for injuries, where the contract provided that the contractor was to receive 10 percent in addition to the actual cost of doing the work.

But it is equally important to know that an owner is not bound to pay a percentage on unreasonable costs incurred by a contractor. For instance, in Westendorf v. Dening, 92 N. Y. S. 858, it was disclosed that a contractor who was employed to perform work on the "cost plus" plan of payment hired a workman at $2.75 per day. After he had seen him work he voluntarily increased his wages to $3 per day.

This court refused to allow the contractor payment on the basis of 10 percent of the workman's wages at $3, and explained that where a contractor undertakes to perform work on the basis of an agreed percent in addition to cost. he is bound to purchase material and employ labor at the lowest price consistent with the particular circumstances.

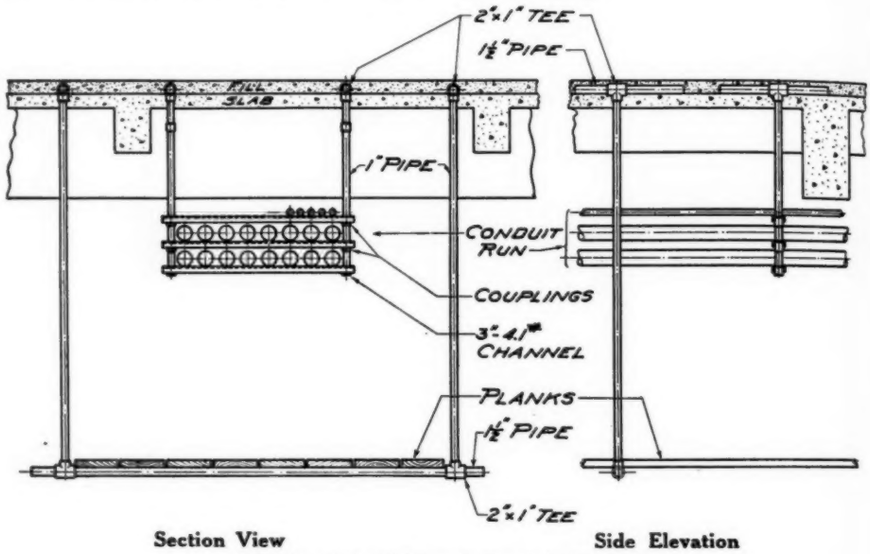
Scaffold and Conduit Hangers

DURING the erection of runs of large conduit on a ceiling it is a common occurrence for the floor underneath to be obstructed by piles of building material, trenches, or equipment. Sometimes the ceilings are high. This makes the run expensive to reach with a scaffold that uses the floor for support.

One contractor has eliminated this cause for delay by hanging his scaffold from the ceiling above instead of resting it on the floor below.

The sketch indicates in how simple a manner this is done. Holes are drilled in the floor through which a 1 in. pipe is passed. A 2 in. by 1 in. reducing pipe tee is screwed on the upper end, and a length of 1½ in. pipe is slipped through the 2 in. run to distribute the load. On the lower end there is screwed another tee of the same size, through which a 1½ in. pipe is passed, sufficient in length to rest in two hangers. This forms a complete stirrup in which planks are laid, making an ideal erection platform. The vertical piece of pipe is made long enough to permit the electricians to work conveniently in a standing position.

In case the fill on the floor above is poured before the scaffold is removed the tees are left embedded, but the pipe is screwed out.



Section View Side Elevation

Sketch of Scaffold and Conduit Hanger

From the sketch it will be seen that the conduit hanger is built in a similar way. If the tees are installed in the slab instead of the fill, a short nipple is allowed to project down through the concrete form, to which an extension pipe is later coupled. The cross-member which carries the conduit consists of 3 in.—4.1 structural channel drilled at each end for the vertical 1 in. pipe. The channel rests on the coupling.

It was used by Hatzel & Buehler, Inc., New York City.

Wiring an Apartment for Radio

Electrical Contractors Are Discovering New Opportunities for Profitable Installations in Radio Wiring

A NEW field for wiring installations has been opened up by the increased use of radio in apartments. In a moderate or large apartment house it is impossible to permit tenants to put antennae anywhere on the roof that they like. The mess resulting from such a lack of system would be hazardous. Consequently many apartment owners are calling in electrical contractors to make installations for radio so that each apartment can have its own program, without any confusion on the roof.

The installation shown here was put in a small 24-family apartment in Syracuse, N. Y., by Krause & Heil, one of the leading electrical contracting firms of that city.

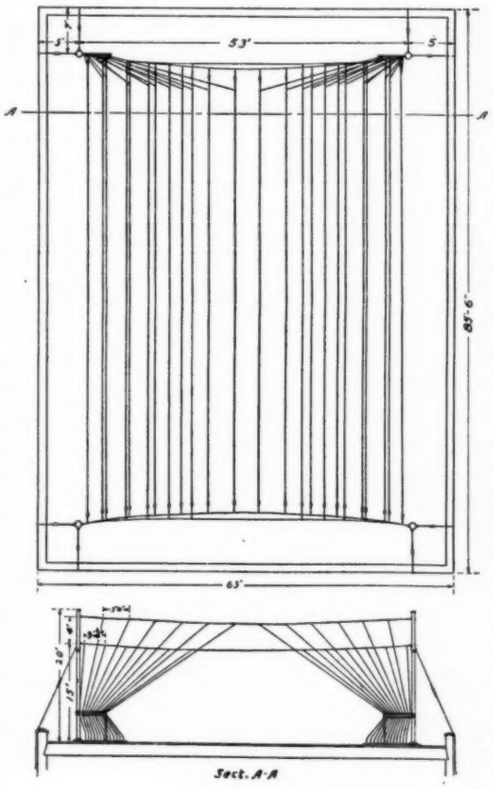
There are 24 apartments in the building, which is rectangular in plan, measuring 63 ft. by 85 ft. 6 in. over all. To design an overhead structure which would provide an antennae for each of the 24 tenants was no small undertaking, but the problem was worked out in a very satisfactory manner by Mr. Roy J. Owen, engineer for Krause & Heil.

The general plan and all essential details of the antenna system are clearly shown in the accompanying drawings.

A steel mast consisting of a 20 ft. length of 2½ in. pipe is erected on the roof at each corner of the building, far enough in from the walls so that it can be properly guyed. Between each pair of masts at the front and rear there are two steel span cables, one attached near the tops of the masts and one 4 ft. lower. The 24 antennas are supported by the span cables, 12 in the upper layer and 12 in the lower layer. The spacing is 4 ft. vertically and approximately 3 ft. to 4 ft. horizontally. The horizontal spacing had to be adjusted to provide clearance between the lower antennas and the lead-in wires from the upper layer.

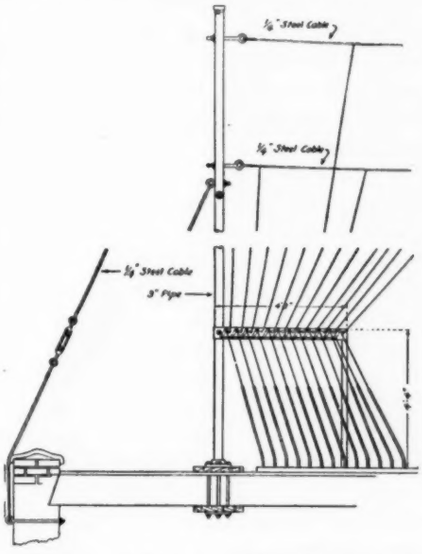
The span cables and guys are ¼ in. galvanized steel strand. Provision is made for taking up slack in the whole system by inserting a turnbuckle in each guy and by attaching the span cables to the masts with eye-bolts. The antennas are 7-strand enamelled copper equivalent to No. 14 B. & S. gauge.

The antenna cables are brought down to small frames at the bases of the two rear masts where they are tied to porcelain knobs, connected to lightning arresters and then soldered to No. 14 copper wires coming up through the roof and encased in loom.



The radio outlet in each apartment consists of a standard convenience outlet receptacle of the polarity type mounted in a standard switch box, this equipment being considered more rugged and durable than the radio jacks made for such use. The lead-in wires from the roof are brought down to these outlets using the common knob and tube type of construction. Six ground wires were installed, each dropping from four outlets to the basement where it is connected to the nearest water pipe.

The installation has now been in use for about five months and has proven



entirely satisfactory. No difficulty is experienced due to interference on account of the parallel antennas. The overhead work withstood a heavy sleet storm without damage. While no one would add this roof work to a building as a purely esthetic feature, the appearance is not at all objectionable and is far better than it would be if each tenant were left to erect his own antenna.

Rewiring Surpasses New Construction

Permits for rewiring far surpass the number for wiring new buildings in the report of William H. Greenlaw, city electrician of Beverly, Mass. He announced that during 1927 there were 112 permits for wiring new buildings. 190 for wiring old buildings, 693 for additional wiring, 307 installations for fixtures complete, 552 of additional fixtures, 106 installations for power and 5 for heating. March and April were the best months for number of applications for permits; while all of the other months were about equal in quantity of applications received.

Chats on the National Electrical Code

A Monthly Discussion of Wiring Practice and Questions of Interpretation, Presented with a View Toward Encouraging a Better Understanding of the Industry's Most Important Set of Rules

Conducted by F. N. M. SQUIRES
Assistant Chief Inspector, N. Y. Board of Fire Underwriters

Interpretations

About a year ago the Electrical Committee of the N. F. P. A. set up a procedure for securing official code interpretation. Since that time there have been nine interpretations officially released and there is still lots of ground to be covered. Many rules as written have several possible meanings according to the way one chooses to read or think about them.

These interpretations should be freely asked and freely answered for all vagueness of Code meanings should be eliminated. Also, the meanings of the interpretations must be set forth in clear, bold and concise wordings. Some of the interpretations in the past have not been easy to interpret in themselves and have left a doubt as to their exact requirements. This does not help the contractor, nor the inspector, nor anyone else who may be interested.

It is of great importance also that the sense and intentions of the Article Committee which sponsored the rule should be reflected in the interpretation of the requirement. This should not be difficult for the Interpretations Committee to obtain.

[Amen!—EDITOR.]

Small Conduits vs. Large Ones

Some time ago a contractor wiring a theatre requested permission to apply Table 3 of Rule 503-L to conduit runs for the cove and auditorium lighting. He was reminded that cove and auditorium lighting did not come under the classification of stage pocket and border circuits and his request was denied.

He had wished to run 34 No. 12 wires in several of 2 in. conduits, but not getting the permission to do so, installed a number of 1 in. conduits with 8 No. 12 wires in each. He is now pleased that he was turned down on his first proposition because he finds that he has saved money. Instead of handling the heavier conduit with its attendant difficulties of installation, a crew of two men were able to take care of this part of the work very readily and quicker than could have been done with the larger pipe. Also, he knows and his customer knows that in case of a disturbance in one circuit only a small part instead of a large portion of his house lighting will be affected.

Metal Raceways in Refrigerators

A contractor recently had a job to extend ceiling lights in a refrigerator so as to conform to the aisles. The ceiling being well out of the way of mechanical injury, he used a metal moulding for these extensions. There were two rooms to this refrigerator, one above the other. After the installation had been completed and the rooms chilled, it was found that the lower room was extremely wet while the upper one was perfectly dry. Of course, in the lower room the fuses began to blow and it was impossible to keep them in. The trouble developed at the fittings which in this case were the lamp receptacles, and in no case occurred in the runs of the raceway itself.

The inspection department violated the work in the lower room on account of its being installed in a damp location, but the upstairs work could not be violated on that account. Of course, some departments will rule that all refrigerators are damp but actual conditions do not always support this claim.

Many reasons were offered as to the cause of the variation of the conditions but they do not bear on the point we wish to bring out; namely, the work in the lower room could be violated under the requirements of rule 504-A of the 1925 Code but that in the upper room could not. But in the preprint of the 1928 Code no prohibition was placed on the installation of raceways in damp locations.

This is too bad because not only will trouble develop at the fittings, but the raceway itself, being made of thin metal, will not stand up long where subject to corroding effects of dampness.

A Complaint Against Junction and Pull Boxes

Many otherwise splendid jobs are spoiled by the use, and especially the abuse, of junction and pull boxes. These fittings have their place in the electrical wiring field but, when used, should be used intelligently. Why spend a lot of money and time in installing an electrical equipment which should be the last word in efficiency and then have the efficiency of it exposed at all times to the hazards of a complete elimination through the failure of a very small part of the installation?

This is the status of work wherein a large number of wires are grouped together in junction boxes and where numerous feeders or circuits may be exposed to interruptions caused by the burning out of a single circuit wire.

The number of wires allowed in a single conduit is limited but no limit has been put upon the number of wires which may be run through a pull box or junction box. Nor is there any limit on the number of conduits which may be run into such boxes.

Some restrictions must be placed on the present practices of crowding wires into these boxes. If these must be used, why not arrange the conduits entering and leaving the box so that compartments may be arranged in the boxes by means of barriers in order that no more than the allowed number of wires for conduit runs will be grouped together within one compartment? Then if one of the wires in the box became hot and burned out, it would affect only the wires in the same compartment and the others would be unharmed.

It is time that inspection authorities

take some action toward getting requirements in the Code governing this important matter.

Use of Varnished Cloth Insulated Wires

The Code allows the use of varnished cloth insulated wires in conduit "if in a permanently dry location". This requirement having been met, are there any other complications to its use? Off hand there may seem to be none but a recent installation presented some.

This type of wire has generally been used around the upper part of rooms where the temperatures have been considered too high for rubber insulation and the conduit in which it has been used has generally been in a horizontal position.

On the job mentioned, the varnished cloth wires were run in as a feeder and installed in vertical conduits. After the feeder had been in for a few days, the inspector noticed that considerable oil had dripped out where the cable had been cut in the junction and panel boxes and had even oozed out through the outer covering. Of course, with the oil running around things were soon in a very "messy" condition.

Investigation by the Laboratories and at the factory showed the cable to be "standard" and that the contractor, being unfamiliar with this kind of material, did not know how to use it. In other words when the cable was hung from heights varying from 10 to 100 ft. the hydro-static pressure was so great that the oil at the lower ends of the cable was forced out. Had the manufacturer known that it was to be used in a vertical position, he might not have used quite so much oil in its makeup.

It was pointed out that when this type of cable is used and cut off the end must be immediately prepared for use. That is, the intercises between the wires must be filled with solder (or the lug put on) and the ends of the insulation taped over and compounded so that the oil will be retained within the insulation.

Another case was recently reported in which on a vertical run due to the use of oil lubricant, the copper core (conductors) of the cable slipped down through the insulation.

Regarding "Why" Certain Rules Are in the Code

A correspondent recently inquired as to whether or not there was someone or some committee who could answer questions regarding the "why of certain Code rules".

This sort of information is not quite within the scope of the work of the official Interpretations Committee, but the Eastern Association of Electrical Inspectors has appointed a Code Standards Committee as its own Interpretation Committee and that this committee will endeavor as far as possible to answer or explain all such questions.

Such matters, therefore, may be sent to the writer who is chairman of the Code Standards Committee of this latter association.

By this offer we do not mean to attempt to take over any of the work of the Interpretations Committee of the N. F. P. A. All questions for official Code interpretation should be forwarded directly to that Committee, but such questions as would not normally come within their province we will endeavor to "pinch hit" on.

Sub-standard and Hazardous Materials

The electrical contracting organizations of New York City are agitating the taking of legal steps toward the prohibition of the sale and manufacture of hazardous materials and devices. Some cities of the United States have already done this and are deriving the benefits from it. Regulation, of course, can only be secured through the passing of proper ordinances or laws.

All branches of the electrical industry should get behind this and extend it throughout all parts of the country. It is by the use of this bootleg material that many hazardous and dangerous wiring jobs are installed and that many otherwise perfect wiring jobs are made dangerous through the attachment of them to unapproved devices.

The sale of dangerous weapons, dangerous drugs and dangerous liquors has already been prohibited in most places, and why should dangerous electrical devices not be prohibited in the same way?

Those interested in this movement should give it all the publicity possible and should mince no words about its being dangerous and hazardous. But when the ordinances and laws are written, care must be taken about the use of these words for by their use the burden of the proof that they are dangerous or hazardous is laid upon the enforcement authorities. It would seem, therefore, that this prohibition should be against "sub-standard" or "unapproved" materials and devices.

A New Way to Present Testimonials

The Art Electric Co., contractors of Toronto, Ont., Canada, print the names and addresses of persons for whom they have made electrical installations on every letter that goes out from its office. The regular letterhead is a four-page peach colored bond paper, printed in red and black. The first page, which is 8½ in. by 11 in. contains the letterhead and space for the typewritten letter.

Page two of the four page letterhead is left blank, and if the letter is long it may be continued from the first page to the second. On page three and four are printed lists of people for whom this contracting firm has installed wiring, motors, fans, and fixtures. The list is a long and impressive one and is certain to produce conviction in the minds of a prospective customer that the concern is a good one.

OUR REFERENCE THE PUBLIC.

REFERENCES.

FACTORY WIRING AND MOTORS

OLD AND NEW HOUSE WIRING AND ELECTRIC FIXTURES

COLD STORAGE PLANTS

ELECTRIC STOVES AND HEATERS

OFFICES AND STORES (Wiring and Fixtures)

Names and addresses are given, under various headings, such as: "Factory wiring and motors", "Old and new house wiring and electric fixtures", "Cold storage plants", "Offices and stores", "Garages", etc. It is interesting that the Art Electric Company has put in wiring and fixtures for seven millinery stores, eleven cafes, four bowling alleys, and three jewellers. Page three of the letter is illustrated.

The Electragist

Official Journal of the
Association of Electragists—International
S. B. WILLIAMS
Editor

License Offenders

Why is it that electrical contractors' associations which have worked so hard to secure a licensing ordinance do virtually nothing to prevent licensed contractors from taking out permits for others who have no license?

Don't expect the city to get greatly exercised over the situation unless you stir things up. Hunt out the offenders and demand punishment.

Only a few have to be punished. The others will then be too frightened to get out of line.

Jobbers or Wholesalers

There is a possibility that the Electrical Supply Jobbers Association may favorably consider at their June convention a change in name to the "National Electrical Wholesale Association."

Contractors and contractor-dealers trust that if this change in name is accepted and electrical jobbers then become electrical wholesalers, that their national association will set up a definition of the term "wholesale".

The dictionary gives the following definition:

"Selling to retailers rather than consumers."

The jobbers we feel are agreeable to this definition, but their conception of the meaning of the word "consumer" is not likely in all cases to be acceptable to the trade.

There are certain classes of customers—all consumers—that are nationally wholesale buyers. They are too large to buy the bulk of their supplies from retailers. Such consumers as a rule buy in wholesale quantities.

The smaller industrials, however,—office buildings, stores—may now and then have an order of a wholesale size but normally they buy in small quantities. The jobber has been soliciting these customers.

Are the latter wholesale or retail customers?

Mail Order Wiring

The largest mail order house in the country is now furnishing free working diagrams to the public with each order for wiring materials from those who "want to save the expense of hiring an electrician."

When will people learn that electricity is dangerous and not to be fooled with by the layman?

Unfortunately most of this work will be done in districts where there is no underwriters' or municipal inspection. Will the power companies hook up jobs so wired?

It's You That Do It

Every association administration is faced with a certain amount of loss of membership from men whose only reason for dropping out is that "the association has never done anything for them" or "they paid their dues but never got anything for them."

An association is not a business. It doesn't sell a member a thing for his dues.

An association is just what its name implies—a number of people associated together to do certain things.

In other words, an association is not engaged in manufacturing, wholesaling or retailing. Its sole job is to do things as a collective body which the members could never be able to do as individuals.

If the association principles are worth while they should be supported by money and by time.

If the association is not carrying out these principles, then the membership should select new leaders who will carry them out.

A national association is organized to do a national job—not a local job. A national association, however, will assist a local association to harmonize its purposes with national thinking and in that way secure the greatest benefit from national progress.

It may be difficult, perhaps, for a man whose work never gets beyond the confines of his home town to become very much excited by national progress. He probably naturally thinks in terms of his own local problems. These are the problems he has to face day in and day out. They are very real to him whereas national problems are not so close and, therefore, seem less vital.

Such men, however, must learn that no town has its individual problems. The problems of one place are the problems of every place. Human nature is the same everywhere. In other words, the local problem is after all a big national problem.

If there is no effort made nationally to find a solution to such a problem, it is hardly likely that many localities will find an answer. However, national solutions to such problems, be they complete or only partial, have the value

that they may be employed locally with some certainty of success. Localities that try to solve their own problems without any outside guidance are just as likely to get in deeper as they are to get out of trouble.

National associations are necessary if the problems of the group are to secure any national consideration.

The Association of Electragists is a national association. It needs members—members who will join not with the thought they are buying something, but members who are anxious to have the electrical contractors have a national voice in industry councils—who are anxious that the contractors' problems be given national consideration.

The plumbers have over 10,000 in their national association. The electrical contractors have 2,000 in their association. The plumbing business is a profitable business with excellent trade relations. The plumber isn't faced with daily competition from his jobber and manufacturer and public utility.

The electrical contractor can have just as good trade relations and competitive conditions as the plumber if he will have the courage to join his national association and urge his fellow competitors to do likewise and if he will have faith.

The job can't be done in a day. It is now being accomplished slowly by an association far too small in membership to be expected to carry such a load. Its progress will quicken proportionately to the rate at which this membership is built up.

Do your part—Join—Today!

Fuses, Of All Things!

It has been brought to our attention that there are thirty-four manufacturers of "gyp" fuses and only twenty manufacturers of approved fuses.

Fuses—the safety valve of the electric circuit—and there are manufacturers who for a small extra profit will stoop to making them below standard!

When manufacturers deliberately, and dealers through ignorance, will traffic in public safety, we are more and more inclined to favor a public posting of the offenders.

European Wiring

What is there about the European low priced wiring that appeals to the central station man? There was a time that we thought it might be that the lower the cost of wiring the more kilowatt-hours the consumer would use.

A recent issue of the *London Electrical Review* gives some data on a very low priced installation which was used in over seven thousand homes of the poorer classes. The average cost per installation was approximately $23.00. The average number of lights was less than five per home, while the average consumption per consumer was 89 kilowatt-hours per annum.

The power companies can't make money in the United States on a residential consumption of 365 kw-hr. per annum.

Again we ask: What are the power companies driving at?

Licensed Dealers

City after city is beginning to view with alarm the rising flood of unapproved devices—both "mavericks" and sub-standard. The local inspector is not equipped to test unapproved products in order to determine which are up to standard. The industry maintains an organization with two laboratories and a trained field inspection force—Underwriters' Laboratories. Every manufacturer of a standard device should secure an approval. There is no good reason for not securing an approval.

Apparently there is only one way to prevent the use of sub-standard and unsafe electrical products and that is by regulating the sale of electrical material.

Portland, Oregon, has done it; has enforced its ordinance and had its police powers upheld in court. Other cities are following suit.

We expect to see a number of cities pass a dealer licensing ordinance in 1928 solely for the purpose of preventing the sale of unapproved electrical materials. While we are not in sympathy with the great American pastime of passing a law everytime we want something done, in the present case we see no other way out.

The sale of unapproved electrical material must be stopped.

Chicago in August

Here it is over four months before the Electragist convention time and already the Chicago committee has its plans well whipped into shape. Seems as though almost everybody, who is somebody in Chicago, has been coralled and given a job to do.

And as for the entertainment of the ladies! This is the year when most men will wish they were of the opposite sex for a week. No women can go to the convention this year at Chicago and not have a good time all the time.

Plans are being made for seating more than one thousand at the annual banquet.

There is, of course, no way as yet of estimating what the attendance outside the Chicago area will be, but it is known that a number of cities are going to send large delegations to put in a bid for the convention next year or the year after.

It sure looks like a big week in Chicago, the second week in August. Everybody's going to be there. Now's the time to make plans.

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Brooklyn (C)	H. F. Walcott	60 Third Avenue
Jamestown (C)	Henry M. Lund	309 Main Street
Nassau-Suffolk (C)	Henry T. Hobby	55 Front Street, Rockville Centre, L. I.
New York City:		
Section No. 1 (C)	Walter Knapp	207 East 43rd Street
Independent (C)	John J. Bauer	100 East 45th St.
Metropolitan (C)	George W. Neil	96 Beekman St.
Niagara Falls (C)	E. M. King	515 Niagara Street
Rochester (C)	Theo. T. Benz	278 State Street
Rochester (L)	Henry F. Burton	89 East Ave.
Schenectady (C)	Richard Spengler	421 McClellan Street
Syracuse (C)	Fred P. Edinger	802 East Water St.
Utica (C)	W. C. Ballda	228 Genesee Street
Westchester Co. (C)	Jack Lalley	14 Mnr. Hse. Sq., Yonkers
Yonkers (C)	Louis Mayer	485 South Broadway
OHIO		
Akron (C)	E. C. Rishel	540 East Avenue
Canton (C)	H. S. Hastings	301 New Vickery Bldg.
Cincinnati (C)	J. F. Riehle	1642 Cedar Ave.
Cleveland (C)	F. T. Manahan	Chester Twelfth Bldg.
Columbus (L)	O. A. Robins	1242 Oak Street
Lorain (C)	A. B. Walton	3150 E. Erie Ave.
Toledo (C)	Fred C. Dunn	Builders' Exchange
Dayton (C)	Clarence Carey	1107 South Brown St.
Massilon (C)	F. D. Mossop	c|o Mesco Electric Co.
Northern Ohio (C)	R. A. Wentz	Elyria
OKLAHOMA		
Pawhuska	C. G. Sego	Pawhuska
OREGON		
Portland (C)	J. R. Tomlinson	51 Union Ave., N.
PENNSYLVANIA		
Altoona (C)	Walter Bracken	Leechburg
Allegheny Valley	E. G. Jackson	12 West Third Street
Du Bois (C)	C. E. Blakeslee	12 E. Long Ave.
Easton (L)	H. Clark Kreider	Arcade Bldg., Center Sq.
Erie (C)	R. D. Goff	11th and French Sts.
Lehigh Valley (C)	A. W. Hill	Bethlehem
Philadelphia (C)	M. G. Sellers	1202 Locust Street
Pittsburgh (C)	D. A. Fleming	518 Empire Bldg.
Wilkes-Barre (L)	Leon N. Sell	Town Hall
RHODE ISLAND		
Providence (C)	H. E. Batman	36 Exchange Place
SOUTH CAROLINA		
Charleston (L)	J. P. Connolly	141 Meeting Street
SOUTH DAKOTA		
Sioux Falls	H. W. Claus	326 S. Phillips Ave.
TENNESSEE		
Chattanooga (L)	P. W. Curtis	725 Walnut Street
Knoxville (L)	Jerry G. Cason	303 West Church St.
Memphis (L)	J. J. Brennan	12-16 So. Second St.
Nashville (C)	J. T. Shannon	c|o Electric Equip. Co.
TEXAS		
Beaumont (C)	J. A. Solleder	Houston & Bolivar Sts.
Dallas (C)	P. B. Seastrunk	2032 Commerce St.
Houston (C)	J. W. Read	715 Capitol Avenue
UTAH		
Ogden	B. Kristofferson	2249 Washington Ave.
Salt Lake City (C)	R. E. Folland	Newhouse Hotel
VIRGINIA		
Lynchburg (C)	J. L. Fennell	c|o Fennell & App
Norfolk (L)	A. W. Cornick	200 Plum St.
Richmond (C)	E. M. Andrews	15 N. Twelfth Street
WASHINGTON		
Seattle (L)	P. L. Hoadley	Seaboard Building
Spokane (C)	William Stack	W. 1121 Cleveland St.
WEST VIRGINIA		
Wheeling	Peter J. Erb	1414 Eoff Street
WISCONSIN		
Green Bay (C)	V. E. Grebel	531 S. Broadway
Madison (C)	Carl J. Marsh	710 Beaver Bldg.
Milwaukee (C)	E. H. Herzberg	1604 Wells St.
Milwaukee (L)	J. S. Bartlett	415 Carpenter Bldg.
Racine (C)	Joseph J. Small	1910 Linden Ave.
CANADA		
Montreal (C)	George C. L. Brassart	674 Girouard Ave.
Toronto (C)	J. A. McKay	302 Excelsior Life Bldg.
Vancouver (C)	J. C. Reston	579 Howe St.
Winnipeg (C)	Fred Ball	300 Princess St.

(C) designates exclusively Contractor-Dealer organization.
(L) designates an Electrical League.

MARCH ACTIVITIES

Electragists to be Organized Locally

A. E. I. Executive Committee Votes to Give Locals Voice in Determining National Policies

IMPORTANT plans looking towards the organization of affiliated and chartered local associations of Electragists, with direct representation from those local associations in the formation of policies and the management of the A. E. I., were developed at the semi-annual meeting of the Executive Committee of the Association of Electragists, International, held in New York City on March 19 and 20.

Speaking for the Executive Committee, President Chamblin in announcing these plans emphasized the greater effectiveness of the work of the A. E. I. through strongly organized affiliated local associations, and announced that the plans include an enlarged field service, which will be principally engaged in the organization of the contractor-dealers throughout the country in affiliated local groups.

To make this program most effective and to bring the Association of Electragists, International, into as close contact with its local groups as possible, a committee has been appointed to prepare a reorganization plan for representation of local association delegates from all affiliated groups upon an International Board which will formulate the general policies and elect the Executive Committee responsible for the direction of the Association. This Reorganization Committee will be prepared with its plans for presentation at the annual convention of the A. E. I. to be held in Chicago in August, at which meeting delegates from every section of the country representing all local associations will be present.

The proposed program of the Industry Sales Conference for greater market development in the wiring and re-wiring of homes and the strengthening of the contractor-dealers, upon whom will fall the responsibility for carrying out this re-wiring program, was endorsed in its general principles.

It was unanimously recommended by the Executive Committee that the name of J. J. Caddigan, superintendent of Relations With Allied Interests Department, Edison Electric Illuminating Company of Boston, be submitted to the annual convention for election as an honorary member of the A. E. I., in recognition of his work of co-operation with the contractor-dealers throughout the territory served by the Edison Electric Illuminating Company and of his unselfish interest for many years in the electragists' problems and the activities of the A. E. I.

New Committee Chairmen

W. H. Ochiltree, president of the Ochiltree Electric Company of Pittsburgh was elected executive committeeman-at-Large for one year. Joseph A. Fowler of Memphis was elected chairman of the Trade Policy Committee, succeeding W. Creighton Peet, who was appointed with James R. Strong of New York and A. C. Brueckmann of Baltimore to the special committee which will have the important task of working out the reorganization plans for closer tie-in with affiliated local associations.

L. K. Comstock of New York was appointed national councillor to the United States Chamber of Commerce. Other assignments as chairmen of national and international committees were as follows:

A. Penn Denton, Kansas City, National Electrical Code Committee; Wm. H. Ochiltree, Pittsburgh, Wiring Methods Committee; L. E. Mayer, Chicago, Architects and Engineers Committee and Standardization Committee; J. H. Schumacher, Winnipeg, Cost Data Committee and Electragists' Data Book Committee; S. J. Stewart, New Orleans, Credit and Accounting Committee; Charles E. James, Fort Pierce, Fla., Legislation Committee; A. C. Brueckmann, Baltimore, Publication Committee and Membership Committee; J. A. Fowler, Memphis, Liability Insurance Committee; C. L. Chamblin, San Francisco, Red Seal Committee; E. C. Headrick, Denver, Radio Committee; R. A. L. Gray, Toronto, International Relations Committee.

A. E. I. Withdraws From Electrical Field Secretary Project

The Executive Committee of the Association of Electragists has voted to discontinue the contribution of the Association to the joint industry support of the work of an electrical field secretary, which has been carried on for the past two and one-half years.

The A. E. I. committeemen feel that the results accomplished toward a more constructive Code revision through the work of an electrical field secretary, as indicated by the action of the Electrical Committee, N. F. P. A., at its meeting in February, do not justify continuing this service.

Armored Cable Situation

The National Electrical Manufacturers' Association has addressed the following letter to electrical contractors, jobbers, architects, and central stations in New York City:

"Rumors have been circulated throughout the trade that the electrical workers' unions will not permit armored cable to be installed. A committee of manufacturers conferred with H. H. Broach, vice president of the International Electrical Workers Union, relative to this, and Mr. Broach recently appeared at the District Attorney's office, Bronx County, in response to a subpoena issued because of a complaint against such interference. On both occasions, Mr. Broach stated that the unions would not take any action to prevent their members from installing armored cable.

"We give this information to you in order that you may no longer be under any misapprehension in this respect.

"We are assured that the minor officials and members of the union thoroughly understand this situation and will abide by the declared policy of Mr. Broach in letter and in spirit."

The permanent personnel of the Dix-Kelly Corp., electrical contractors of Fort Wayne, Ind., gathered in front of the store to have this picture taken.

Toronto Gets New Licensing Ordinance

A new licensing ordinance has been passed by the city of Toronto, Canada, to go into effect on May 1. The Toronto contractors have been working for this measure for some time and feel highly elated at its passage.

Under the new ordinance both contractors and wiremen must take out licenses, the fee for the former being $25.00 a year and the latter 50 cents a year. The examining board is to be picked from the inspection department, city architect, union, contractors and central station inspection department.

One of the provisions of the ordinance is for the purpose of preventing any but well qualified men from becoming contractors. To secure a license from this time on a man must show that he has been employed in the trade for at least four years and he must be able to present a record of his employment during that period signed by his employers.

The new Canadian Electrical Code also becomes effective in the Province of Ontario on May 1.

Lighting Equipment Exhibit

The national lighting equipment exhibition will be held in Chicago June 11 to 16, according to an announcement by Granville P. Rogers, managing director of the Artistic Lighting Equipment Association.

Licensing Canadian Contractors

Examining and licensing of electrical contractors and journeymen was advocated by electrical contractors of Alberta, Canada, in convention at Edmonton February 17. A bill was drafted and approved carrying out this idea, and was thoroughly and favorably discussed during the meetings. It provides for a chief inspector and assistants. Contractors, jobbers, journeymen, and central station representatives were present.

New League Seal

The Metropolitan Electrical League has adopted this design as its emblem to be used in advertising, on letterheads, stickers, etc. The league has dropped the words "of Boston" from its name, since there are many members from nearby suburban cities and the league is not just a Boston organization.

Correlating Committee Finishes Work on Code

As stated in the March issue of THE ELECTRAGIST the Electrical Committee found the revision of the Code to be so great a task that the work was turned over to a correlating committee to be completed. This smaller committee consisting of 13 members met in New York on March 22, 23 and 24 and was able to complete the task which had been assigned to them.

The final report prepared by the correlating committee consists of a complete draft of the proposed 1928 Code and will be published as soon as possible for distribution to the Electrical Committee. The Electrical Committee is called to meet at Atlantic City on May 3. The members will thus have had ample time to digest the report and it is considered highly probable that the report will be formally adopted without any material change. The next step will be the submission of the proposed rules to the N. F. P. A., which organization will convene on May 7 and will undoubtedly ratify the report. Finally, the rules must be acted upon by the American Engineering Standards Committee and when approved by this body will become effective as soon as published. Approval by the A. E. S. C. is merely a matter of form after all interested parties have come to an agreement.

The correlating committee accepted as final all decisions made by the electrical committee in the February meeting. The report of this meeting published in this magazine last month therefore covers all the more important features of the proposed Code with the exception of certain parts of Article 5 and 16. Victor H. Tousley, chief electrical inspector of the City of Chicago, was chairman of the correlating committee and R. B. Shepard of Underwriters' Laboratories the secretary.

Successful Electrical Exposition

A very successful electrical exposition was held in New Orleans March 5-10 by the local electrical league. One of the features was a model electrified farm, with a complete demonstration of how electricity can aid in eliminating drudgery and increase efficiency. There was a demonstration of plants growing under artificial electric light; a model airport with airport lights and airplane direction beacons; the largest and smallest incandescent lamps; and models of the newest electrical products, appliances, and fixtures. All branches of the electrical industry cooperated to make the exposition a success.

John Kuhlemeyer Talks on Overhead

John Kuhlemeyer, contractor of Chicago, and secretary of the Illinois State Association of Electragists, addressed members of the Youngstown Electrical League on the subject of "Cost and Overhead Analysis". The secretary of the league after the meeting commented that: "Nowhere in the country could a man be found who has as keen an understanding of the problems of the wiring contractor, and unlike many writers and speakers who point out the troubles, handicaps, hardships and shortcomings

of the wiring contractor of today, Mr. Kuhlemeyer has the logical solution for most of these problems."

Electrical Business University

J. E. North, president of the Electrical League of Cleveland, believes an electrical business university should be established to teach the coming generations a knowledge of the electrical merchandising business, so that there will be 16,000 salesmen to sell in the next ten years, $8,000,000,000 worth of electrical equipment to people in 16,000,000 wired homes.

Contractors' Code of Ethics

Plank number one of a Code of Ethics has been adopted by the contractors' association of Salt Lake City, Utah, which reads as follows: "Members of the association shall regard themselves as being engaged in a business in which there is a well defined duty and obligation toward the public and themselves. The business demands that members use every honorable means to uphold the dignity and honor of this vocation, to exalt its standards, and extend its spirit of usefulness."

New Officers of Los Angeles Association

The members of the Electrical Contractors and Dealers' Association of Los Angeles, Cal., have elected the following to the executive committee: J. G. English, H. H. Walker, T. J. Norton, J. Arthur Curtis, R. M. Fry and B. R. Hensel.

J. R. Wilson, secretary of the estimators' section, announces the election of the following officers: President, Hyde, of George L. Patterson Company; vice president, Chandler, of B. L. Perry, Inc.; treasurer, Burdick, of Newbery Electric Company, and members of executive committee: Booth, English Electric Company; Drake, Foulkes Electric Company; Bennett, Newbery Electric Company, and Ellet, of Los Angeles Electric Works.

Richmond League Holds Election

The Electrical League of Richmond, Va., elected L. F. Riegal, sales manager of the Virginia Electric and Power Company, president at the annual meeting in January. He succeeds T. W. Wilmer. W. H. Jenks was elected vice president and M. B. Ehmig, secretary and treasurer. The annual report of the retiring president showed that the activities of the club during the past year were centered on the Red Seal plan and on decorative Christmas lighting. Mr. Riegal submitted plans for a newspaper advertising campaign to promote a better understanding on the part of the public of what is good house wiring and how the electrical contractor can help in making the home convenient, comfortable and liveable.

How Long is a Piece of Conduit?

It has been customary to think of the length of a standard piece of conduit as 10 feet, but such is not the case. If the coupling is included the 10 feet is correct; but in estimating the number of feet of a conduit run the coupling does not figure in.

The length of a piece of conduit, so far as the contractor is concerned, is from one end to the other, exclusive of coupling. The standard lengths of conduit without couplings are as follows:

Trade Size	Length
½ in.	9 ft. 11½ in.
¾ in.	9 ft. 11½ in.
1 in.	9 ft. 11½ in.
1¼ in.	9 ft. 11 in.
1½ in.	9 ft. 11 in.
2 in.	9 ft. 11 in.
2½ in.	9 ft. 10½ in.
3 in.	9 ft. 10½ in.
3½ in.	9 ft. 10 in.
4 in.	9 ft. 10 in.
5 in.	9 ft. 9 in.
6 in.	9 ft. 9 in.

Standard lengths of rigid conduit measure ten feet including the coupling.

Merchandise Man Joins N. E. L. A.

C. Ernest Greenwood, well known to electrical contractors as a sturdy advocate of better merchandising of electrical goods on the part of all branches of the industry, has joined the staff of the National Electric Light Association as director of the newly created Commercial Department.

In announcing the appointment, Paul S. Clapp, managing director of the association, said: "Many power and light companies in all parts of the country are trying to determine and pursue those merchandising policies that will best serve all branches of the industry as well as allied interests, and this latest move should be of material assistance to them."

For the last two years Mr. Greenwood has been chairman of the general merchandising committee, the inaugurator of the inter-trade conference, and has devoted much time to cooperative merchandising between central station and contractors.

California Inspectors Convene

Addresses by outstanding electrical men featured the fifth annual meeting of the California Association of Electrical Inspectors, held at Santa Barbara, Calif., March 22, 23 and 24. Clyde Chamblin, president of the Association of Electragists, Int., addressed the meeting, and the following also spoke:

W. L. Frost, "The Public Utility, Its Future Load and the Inspector"; Charles H. Lum, "Why a Standard"; George B. Kimball, "Unsafe Wiring and Equipment, and Why"; Herbert G. Ufer, "The Fuse, the Switch and the Laboratories"; William Cyr, "Why a Cop"; S. W. Borden, "Grounding"; C. W. Beaton; and Mayor T. R. Finley. One afternoon was occupied in informal discussion of inspectors' problems and the proposed changes in the National Electrical Code.

Value of Red Seal

The value of the sales efforts back of the Red Seal plan is noted by members of the Electrical League of Minneapolis, who have discovered that as a result of the plan outlets in Minneapolis homes have been increased an average of 9.5 outlets per home, or 38,475 extra outlets in the year 1927. Figuring these outlets at $2.30 per outlet, the league has produced $88,492 worth of additional outlet work for electrical contractors.

New Massachusetts License Law Proposed

The Massachusetts State Legislature is considering a new licensing law for electricians which defines the terms "journeyman" and "master electrician" and specifically fixes the work to be done by each. It provides a fee of $10.00 for a master's examination with $10.00 annual renewal and $5.00 for the examination of journeymen, with $2.00 annual renewal fee. The State

Board of Examiners held a hearing on the bill to obtain the opinion of interested citizens. I. S. Cowan, representing contractors, J. J. Caddigan, and E. G. Jay of the Metropolitan Electrical League were present, as well as Walter I. Fuller, inspector of Somerville, Mass., C. D. Keaveney, of the I. B. E. W., and others.

New Red Seal Emblem

The new Red Seal emblem to place on the service entrance switch of approved Red Seal homes has been designed by the S. E. D. and is now being distributed. The new emblem is similar to the old in text, but it is smaller, more compact and more proportionately designed.

Chattanooga Plans New Ordinance

A local ordinance providing for metal protected installations throughout the city of Chattanooga has been prepared by the Chattanooga Electrical League for submission to the city council. Ordinances now in force provide for a zone of metal protected circuits in the business section, and the new ordinance would extend this zone to include the entire city.

Oregon Electragists' Convention

Oregon electragists met at Salem, Ore., February 25, for their semi-annual meeting. Among the speakers were: C. A. Vibbert, president of the organization; M. A. Preisz, who spoke on "Know Your Costs"; Berkeley Snow, whose topic was "Electrical Leagues"; George W. Kable, "The Farmer—A Potential User of Electricity"; F. D. Weber, of the Oregon Rating Bureau, "Adequate State Inspection". After the all day session a banquet was held.

Grounding Discussed

Electragists of Indiana held a one day meeting and banquet on February 23, at which Grounding was the subject of considerable discussion. W. M. Runyon, of the Crouse-Hinds Company gave an address on this subject; other talks were given by B. V. Bosard, on "Relation of Public Utilities Company to Electrical Contractors"; A. H. Meier, Chief Electrical Inspector, Evansville, on "Municipal Inspection"; Arthur P. Eberlin, "Organization"; Thomas Bibber, and John Kuhlemeyer.

Artificial Lightning

Artificial lightning of 3,600,000 volts has been produced in the high voltage engineering laboratory of the General Electric Company, Pittsfield, Mass., according to F. W. Peek, Jr., in charge of this work. The electricity is produced by a new type of generator which stores the electricity and then discharges it in a blinding flash. The object of the study is to secure information on the nature of electricity and lightning.

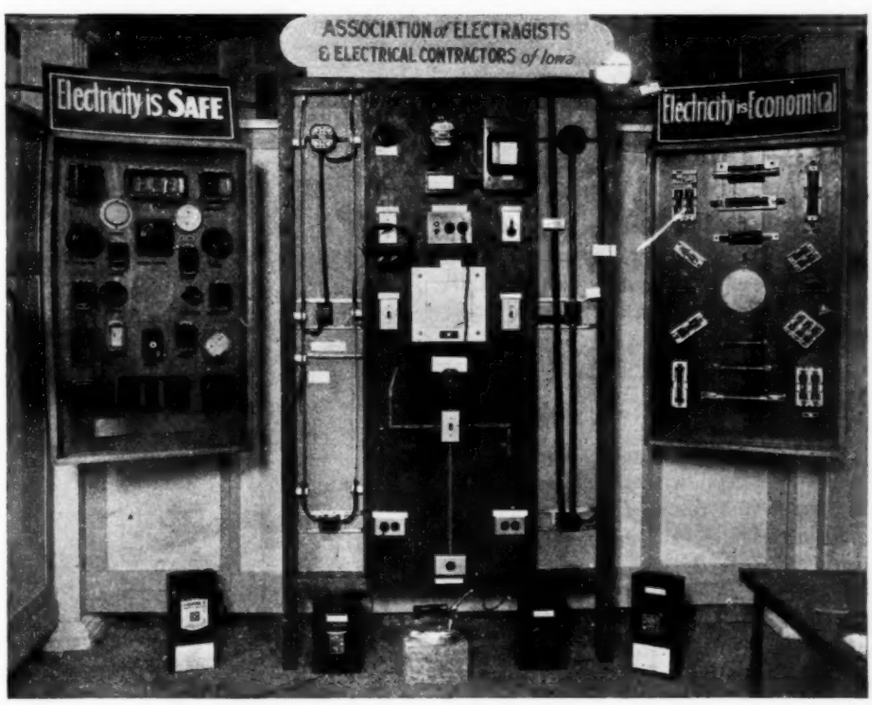
New National Electrical Safety Code

The Bureau of Standards, of the United States Department of Commerce, has published the fourth edition of the National Electrical Safety Code, which includes rules approved by the American Engineering Standards Committee on November 15, 1927.

Electrical Exhibit Emphasizes Safety

THE Iowa State Electragists and the Master Electricians' Association of Des Moines, Iowa, which are affiliated with the Association of Electragists, International, held a joint electrical exhibit at the Iowa Farm and Home Exposition January 11, 12 and 13. The exhibit, pictured here, emphasized safety.

The middle exhibit shows different kinds of wiring installation, both roughing in and trim. 1. The knob and tube type of wiring is polarized, showing the construction for duplex convenient outlet, wall light and tumbler switch, also a properly made soldered joint with rubber and friction tape partly wrapped. 2. Rigid conduit for the same outlets. 3. Fish through old house wiring in loom and clamped into metal outlet boxes. 4. Braid X wiring for old or new houses. 5. Wiremold, with single convenient outlet, tumbler switch and light outlet. 6. Four circuit, flush type, safety distribution panel, to be mounted in the wall near the kitchen, for convenience of re-fusing. 7. Combination push switch, pilot light and receptacle for electric iron. 8. Combination switch and receptacle mounted in breakfast nook, for electric toaster and percolator. 9. Safety meter setting with safety entrance switch and approved entrance fitting. 10. The safety, sealed, externally operated switches on the floor will be used in Des Moines when the new Code goes into effect, which is now under supervision. 11. Radio loud speaker outlet.



New Ordinance Requires Outlets

One appliance outlet must be installed in the living room, dining room, breakfast room, nook and kitchen, and near the ironing board, according to the new electrical ordinance of the city of Pomona, Calif. Rigid conduit, metal moulding or armored cable is required in business buildings and in all houses of more than eight rooms; ceiling outlets in bathrooms, toilets, laundries, and kitchens must be controlled by wall switches; all material and devices used or offered for sale for electrical purposes must be approved by the City Electrician unless listed by the Underwriters; it is unlawful to use pennies or any other device as a substitute for fuses. Provision is made for licensing of electricians, and for a city electrical inspector. W. A. Long is electrical inspector for the city of Pomona.

California Motor Men Elect

The following officers were elected by members of the Motor Section, California Electragists, at the first meeting, held at Fresno, February 10 and 11: H. D. Adams, Farnsworth Electric Company, San Francisco, president; Frank Broiles, International Electric and Machinery Company, Los Angeles, vice president; and E. E. Elzea, Electric Motor Shop, Fresno, secretary. The trade policy committee includes: F. Sievers, K. M. Noble, Walter Vance, Frank Broiles, and L. H. Ellett.

Electricity on the Farm

The bulletin "Electricity on the Farm and in Rural Communities" has been published by the Committee on the Relation of Electricity to Agriculture, and is now for sale. It may be obtained from the committee at 1120 Garland Bldg., Chicago, Ill., for 50 cents a copy.

Red Seal Progress

More than 6,000 homes have been sold a Red Seal wiring job, according to figures just released by the Society for Electrical Development. The number of Red Seals actually awarded is 4,022, and there are 2,026 applications pending which will undoubtedly be awarded seals as soon as the houses are completed and inspected. The total number of awards made in 1927 was 2,556, which is more than half of the total number of awards to date.

Each year has shown an increase in Red Seal houses.

Toronto, Ont., and Detroit, Mich., are the leading Red Seal districts, having totals of 2,101 and 690 awards, respectively. California, which operates in several districts, has 663 awards to date. Other sections that are doing well are Rochester, with 313; Pittsburgh, 466; Niagara, 251; Vancouver, 434; Minneapolis, 156; Youngstown, 133; Calumet (less than a year old) 20.

Red Seal Increases Outlets

RED Seal activities increases the number of outlets from 30 to 103 per cent, with an average of 59 per cent, according to statistics compiled in a house wiring survey in Kansas City, Mo., made by George W. Weston, Secretary-Manager of the local Electric Club. The survey was divided into three parts, one section dealing with medium sized houses, one with large houses, and one with small bungalows. The largest increases attributed to the Red Seal plan came in large houses, in which the average outlets was increased 67 per cent; while in medium houses the increase was 61 per cent; and in bungalows it was 46.5 per cent. Complete figures follow:

HOUSE WIRING SURVEY—KANSAS CITY, MO.

WIRING OUTLETS IN 35 2-STORY 6-ROOM HOUSES

	Non Red Seal		Red Seal		Red Seal Increase
	Total	Avr. per House	Total	Avr. per House	In Outlets
Ceiling	459	13	689	20	50%
Bracket	409	12	559	16	36
1-Way	328	9	495	14	51
3-Way	136	4	214	6	57
Conven.	333	9.5	697	20	109
Special	...	..	27	.8	...
Total	1665	48	2681	76.8	61%

WIRING OUTLETS IN 15 HOUSES, OVER 6 ROOMS

	Non Red Seal		Red Seal		Red Seal Increase
	Total	Avr. per House	Total	Avr. per House	In Outlets
Ceiling	250	17	390	26	56%
Bracket	212	14	258	17	22
1-Way	163	11	266	18	63
3-Way	64	4	130	9	103
Conven.	185	12	397	26.5	115
Special	...	..	17	1	..
Total	874	58	1458	97	67%

WIRING OUTLETS IN 20 BUNGALOWS

	Non Red Seal		Red Seal		Red Seal Increase
	Total	Avr. per House	Total	Avr. per House	In Outlets
Ceiling	238	12	296	15	24%
Bracket	163	8	201	10	23
1-Way	170	8.5	225	11	32
3-Way	42	2	109	5.5	159
Conven.	171	8.5	303	15	77
Special	...	..	15	.8	..
Total	784	39	1149	57	46.5%

SUMMARY OF THE 70 HOUSES

	Non Red Seal		Red Seal		Red Seal Increase
	Total	Avr. per House	Total	Avr. per House	In Outlets
Ceiling	947	13.5	1375	19.6	45%
Bracket	784	11	1018	14.5	30
1-Way	661	9.5	986	14	49
3-Way	242	3.5	453	6.5	87
Conven.	689	10	1397	20	103
Special	...	..	59	.8	..
Total	3323	47.5	5288	75.5	59%

Survey made by G. W. Weston, Secretary-Manager of Kansas City Electric Club, and covers houses wired in 1926 and 1927.

Contractor Dealer Notes

Herman Andrae Electrical Co., Milwaukee, Wisconsin, has just completed the electrical work on the new Schroeder Hotel, the newest and largest hotel in Milwaukee.

Dissolution of the partnership of Rokobrant & Drake, electragists of Shelbyville, Ind., has been announced by Morris H. Drake, who will continue the business under his sole ownership, under the name "Drake Electric Company." Mr. Drake has drawn up plans for a new two-story building to house his electrical business, to be finished this spring, with space for a large show room of electrical appliances and fixtures, a stock room and a motor repair department. The building will cost about $20,000.

William G. Stretton, electrical contractor of Woburn, Mass., has been elected president of the city council.

Increased volume of business has necessitated the removal of the Groce Electric Shop, Worthington, Ohio., to larger quarters in North Columbus, Ohio. E. C. Groce, owner of the store, established the business two years ago.

The new Sacajawea Hotel, LaGrande, Ore., has been completed, the electrical work being done by the Electric Service Co., of that city. According to an announcement by the concern, 70,420 ft. of rubber covered wire was used in the installation; 20,000 ft. of conduit, 800 switch boxes, and 1,200 outlet boxes.

Two Rochester, N. Y., electrical contractors announce a merger which combines the Vanderlinde-Lathrop Company and the Wirley Electric Company into Vanderlinde-Wirley, Inc., a concern which handles electric wiring, repairs, motors, radios and appliances.

Jobber Notes

A fire in Louisville, Ky., partly damaged the Tafel Electric Co., on February 13. Because of prompt shipments of manufacturers and cooperation of local competitors, according to Paul Tafel, president of the concern, shipments were not delayed over twenty-four hours.

New Electragists

The following contractor-dealers have made application and been accepted into the A. E. I. since the publication of the last list in the March issue:

CALIFORNIA

Lomita:
Carvill Elec. Co.

Sacramento:
Luppen & Hawley, Inc.

San Francisco:
Hampton Elec. & Mfg. Co.
Schultz-Morris El. & Engrg. Co.

Stockton:
E. H. Grogan Co.

Roseville:
Franklin Electric

CONNECTICUT

New Haven:
Wm. A. L. Dallas

DISTRICT OF COLUMBIA

Washington:
R. L. McDormand

FLORIDA

Longwood:
Service Elec. Corp.

Palm Beach:
McGinnis Elec'l Service

GEORGIA

Atlanta:
Bailey-Oliver Elec. Co., Inc.
McGaughey Elec. Co.
McKee Elec. Co.
Edward C. Parker
Rehm & McKamy
Russell Elec. Co.

ILLINOIS

Chicago:
Fuchs Elec. Co.

LOUISIANA

New Orleans:
Elecl. Contrg. & Engrg. Co.

MARYLAND

Baltimore:
Baltimore Gas Light Co.
Greenfield Elec. Co.
Hanover Elec. Co.
H. C. Roberts Elec. Sup. Co.
Chas. A. Russell

MASSACHUSETTS

Springfield:
M. L. Schmitt

Watertown:
William H. Hughes Elec. Co.

MICHIGAN

Hamtramck:
Timm Elec. Co.

Saginaw:
J. Gregory Elec'l Co.

MISSISSIPPI

Jackson:
Stuart C. Irby Co.

MISSOURI

St. Louis:
Paul Wendt Elec. Co.

NEW HAMPSHIRE

Berlin:
Stahl's Elec'l Store

NEW JERSEY

Collingswood:
Howard E. Goff

NEW YORK

Alexandria Bay:
A. E. Anson

Buffalo:
John H. Evans

Clyde:
Carlisle Benjamin

New York City:
Greer Elec. Constru. Co., Inc.

Rochester:
F. A. Mott Elec. Co.

Sea Cliff:
Charles Yandik

OREGON

Baker:
Tran Alfrey

Eugene:
Clarke Elec. Co.

Klamath Falls:
Donald D. Van Fleet

LaGrande:
H. & S. Elec. Co.

Portland:
W. H. Emrick, Inc.
Peninsula Elec. Co., Inc.
Star Elec. & Radio Co.

TEXAS

Lubbock:
DeWitt Elec. Co.
Fletchers Elec. Shop

Weslaco:
Weslaco Elec. Co.

WASHINGTON

Port Angeles:
Pegram Elec. Co.

WISCONSIN

Dousman:
Dousman-Electric

Milwaukee:
A. C. Electric Co.
City Elec. Co.
Commercial Elec. Co.
John Funck Elec. Co.
W. J. Henning Elec. Co.
Home Elec. Co.
Jung Elec. Service Co.
Krohn Elec. Co.
L. & K. Elec. Co.
Livingston Elec. Co.
R. Melaun Elec. Co.
A. J. Moser
Reliance Elec. Co.
J. C. Richter & Son
Schaefer Elec. Co.
Schauer Elec. Co.
F. L. Schauz Elec. Co.
Scholbe Elec. Co.
Schowalter Elec. Co.
Sorgel Elec. Co.
Schultz & Fuhr Elec. Co.
Stenz Elec. Co.
Surges Elec. Co.
Uihlein-Ortman Elec. Co.
U-K Elec. Co.
Vincent Elec. Co.
Weinman Elec. Co.
West Side Elec. Co.

North Milwaukee:
A. Becker Elec. Co.
A. J. Chase Elec. Co.
R. Place Elec. Co.

Wauwatosa:
A. C. Behling Elec. Co.
Fernhaber Elec. Co.

West Allis:
Circuit Elec. Co.
Harry Hodgson Elec. Co.
Lee Elec. Co.
Root Elec. Co.
West Allis Elec. Co.

CANADA

Toronto, Ont.:
Elec'l Mainte. & Repairs Co., Ltd.
Harris & Marson
E. L. Roxborough

News of the Manufacturers

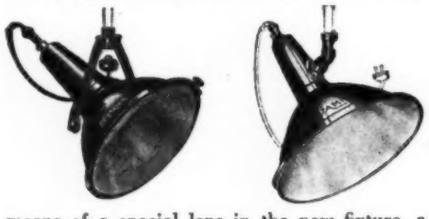
Elbow Former

Henderson Electric Co., Ampere, N. J., is making an elbow former for the purpose of bending conduit elbows. The device is designated with a bending groove which prevents slipping, flattening and kinking, while

the curve of the groove is the same as a standard conduit elbow. To make an elbow the conduit is placed in the former, the hollow bending handle is slipped over it and the handle is pressed down until it strikes the bottom of the enlarged end of the bending groove. It is made in three sizes: ½ in., ¾ in., and 1 in.

Projectolite

A special lighting unit for illuminating surfaces from an angle is announced by Benjamin Electric Mfg. Co., Chicago, especially for use in automobile and car body spraying and finishing departments, furniture plants, etc. By



means of a special lens in the new fixture, a powerful floodlight beam is flattened and broadened so as to direct a larger part of the light to a point farthest from the light source and a smaller portion to the points nearest the reflector, thus producing a even illumination over the surface.

Polyphase Switches

Trumbull Electric Mfg. Co., Plainville, Conn., is manufacturing a new line of polyphase switches built in sizes from 60 amp. to 400 amp., with test connections, and from 60 to 600 amp. without test connections. These are furnished with fuses sealable or accessible, but the latter are accessible only when the switch is in the "off" position. The switches have slate bases, with the contacts mounted on top where they can be inspected in the "on" position; while test connections are mounted above the jaw posts.

Sockets

General Electric Co., Schenectady, announces a new line of sockets to accommodate the new intermediate base lamp recently brought out by this company. In the line are nine styles of lampholders and a screw base adapter, the lampholders including designs for candle effects, electric signs, and weatherproof decorative strings.

Fan Hangers

A new fan hanger is being manufactured by General Electric, which accommodates most makes of wall fans of 16-in. or smaller. It is used in combination with a wall elexit and flush plate, but is sold as a separate unit. The wall fan is bolted to the fan hanger which hooks into the elexit and is locked in place by a spring lock plate. When the fan is not needed it may be removed by unhooking the spring lock and the elexit may then be used as a convenience outlet.

Fixture Switch

McGill Mfg. Co., Valparaiso, Ind., has announced an improvement in the levolier fixture switch it catalogs as No. 61, which is recom-

mended for industrial lighting, stores, restaurants, assembly halls and gymnasiums. The size is 1⅛ in. by ⅞ in., which the manufacturers claim is the smallest 6-amp. pull switch made.

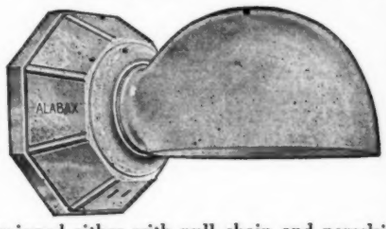
Industrial Lighting Chart

Benjamin Electric Mfg. Co., Chicago, has prepared a reference wall chart for conven-

ience in specifying and ordering industrial lighting equipment. The chart gives the right type and size of industrial equipment for any particular job.

Lighting Units

A new wall lighting unit with convenience outlet has been added to the line of porcelain brackets and receptacles manufactured by Pass & Seymour, Syracuse, N. Y. The unit is



equipped either with pull chain and porcelain tassel, or keyless. The base is hexagonal. The unit is available in several color combinations.

Illuminated Numbers

A new series of illuminated house numbers has been produced by the Novelty Lighting Corp., Cleveland, Ohio, which include a number of lanterns and lighting fixtures which hang from the porch ceiling, or are attached to the wall, and which carry the house number on the glass. A number of different designs are furnished. The lanterns are made of copper and the figures are changeable.

Induction Motors

A line of squirrel cage induction motors suitable for starting on full line voltage is being placed on the market by Allis-Chalmers Mfg. Co. These motors are normal torque, high reactance machines and will not draw an undue starting current. They are built in ratings 7½ to 30 h. p., 600 to 3600 r. p. m., low voltage, and are available with either sleeve or roller bearings. A magnetic switch with push button control is the starting equipment required.

Circuit Breakers

A new line of enclosed circuit breakers is announced by the Roller-Smith Co., New York. Several types are included in the line; one with a free handle, removable cover, 80 amp., 250 volt, three-pole, overload, time-limit. Another type has a capacity range of 5 to 100 amp., for potentials up to 250 volts, d. c. or a. c., 1-, 2-, 3-, and 4-pole; overload, under-voltage and combinations, with instantaneous trip.

Automatic Induction Starter

Lincoln Electric Co., Cleveland, has announced a new automatic induction starter with two adjustable features: One is in the starting current and torque and is made by changing the position of the rotor in the regulator. This rotor is index mounted and the starting torque and current of the motor are increased by going to the higher numbers of the scale and decreased by going to the lower. The other adjustment is in the current at which the throw-over takes place. This is controlled by retarding solenoid, which is operated by the motor current.

OKONITE

QUALITY

Okonite Products
OKONITE INSULATED WIRES AND CABLES
VARNISHED CAMBRIC CABLES
OKONITE INSULATING TAPE
MANSON & DUNDEE FRICTION TAPES
OKONITE CEMENT
OKOCORD
OKOLOOM
Okonite—Callender Products
IMPREGNATED PAPER CABLES
SUPER-TENSION CABLES
SPLICING MATERIALS

Quality is never a result of mere accident. In the case of Okonite Products, it is the result of fifty years adherence to the finest of raw materials and to the development, in the two plants here illustrated, of methods which are wholly unique in manufacturing rubber insulated wire and varnished cambric and impregnated paper insulated cables.

THE OKONITE COMPANY

THE OKONITE-CALLENDER CABLE CO., Inc.

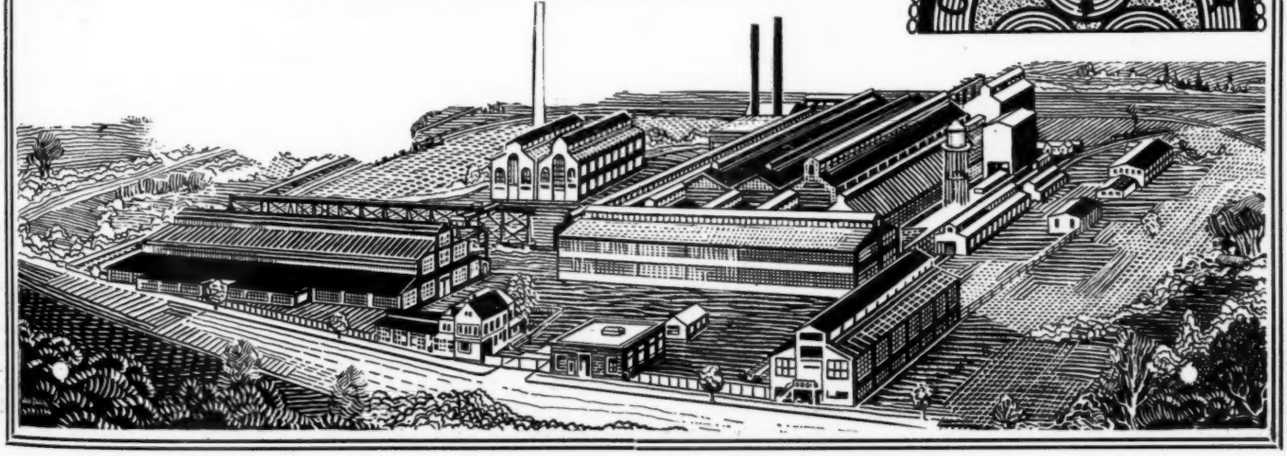
FACTORIES: PASSAIC, N. J. PATERSON, N. J.

SALES OFFICES: NEW YORK - CHICAGO - PITTSBURGH - ST. LOUIS - ATLANTA
BIRMINGHAM SAN FRANCISCO LOS ANGELES SEATTLE

General Electric Supply Corp., Boston, Mass. F. D. Lawrence Electric Co., Cincinnati, O.
Novelty Electric Co., Philadelphia, Pa.

Canadian Representatives: Engineering Materials Limited, Montreal
Cuban Representatives: Victor G. Mendoza Co., Havana

OKONITE-CALLENDER



Surface Switch

Bryant Electric Co., Bridgeport, Conn., announces a new expulsion type surface switch built especially for inductive loads, for controlling 3-phase a.c. motors up to and including 2 h. p. It is reversible, triple pole, with a rating of 20 amp., 250 volt; 10 amp., 600 volt.

Three covers are available: one a cast iron cover designed to be attached to conduit fittings made by Crouse Hinds Co., Appleton Electric Co., Columbia Metal Box Co., and V. V. Fittings Co.; the second is essentially the same but finished sherardized; the third is a stamped steel cover with insulating lining.

Motor Starter

A new motor starter with a maximum rating of 7½ h.p. has been announced by Westinghouse Electric and Mfg. Co., East Pittsburgh, Pa. It is designed for the starting and protection of small induction motors driving machine tools, and machines where remote control with protection to operator, motor and machine is desired. It can also be used as a magnetic primary switch for wound rotor motors within its capacity. It is adaptable to either hand or automatic reset after an overload. Thermal overload protection is provided; dimensions of the cabinet are 8½ in. wide by 12½ in. high by 5¾ in. deep.

Wire Connectors

Jiffy Wire Connector Co., Hackensack, N. J., announces two new additions to its line of wire connectors. One is designed for solderless wire connections up to three No. 10 wires or equivalent, either solid or stranded. The

ends of the wires are thrust into the connector, which is made of aluminum copper alloy, and a set screw holds the wires together. The other type is a tap wire connector of heavy brass.

A set screw holds the wires in place and the connector can be used for wires of different sizes or combinations up to two No. 12 or equivalent.

Commutator Stones

Martindale Electric Co., 1267 West 4th St., Cleveland, Ohio, has produced a new commutator stone for touching up commutators and slip rings. One end is made of coarse cutting grade and the other end of fine finishing grade. The stones are furnished in various sizes for carrying in the pocket or tool kit.

Cord Sets

General Electric Co., Bridgeport, announces new flexible rubber cord sets, made up in 10- and 20-ft. lengths of Nos. 16 and 18 cord. One end of the set has a cap while the other is stripped for wiring. This set may also be obtained with a pony attachment compound plug body and cap, consisting of one mould, with the prongs moulded into the cap, eliminating the necessity of wiring the cap.

High Mounted Fixtures

The Ivanhoe Division of the Miller Co., Cleveland, has announced a line of high mounting units designed for use in outdoor areas or indoors when a large area must be

lighted with units mounted 25 ft. or more above the floor. Lamps from 300 to 1500 watts may be used with the equipment, which concentrates and redirects the light to the working plane. They are finished to be protected against rust and smoke fumes or atmospheric conditions.

Threadless Fittings

Erie Malleable Iron Co., Erie, Pa., has announced several new items in the line of threadless conduit fittings. One is designed to connect fibre conduit to metallic conduit in places where fibre conduit is used through the concrete and iron conduit for the risers. A new flange nut is announced which may be used with the "Kondu" threadless box; and in the line there is a new reducer for knockout box connections which permits the connection of ½ in. conduit to a 1 in. or 1¼ in. opening.

Drill Kit

Star Expansion Bolt Co., New York, is now making a drill kit which contains twist drills for masonry drilling. The drills automatically clean the dust from the holes which are made under rapid taps rather than heavy blows with the hammer. The tool kit contains twist drills for $\frac{7}{32}$ in., ¼ in., $\frac{5}{16}$ in., ⅜ in., $\frac{7}{16}$ in., and ½ in. holes, and a drill holder.

Electric Range

A new automatic wall- or floor-plug electric range is announced by the Cedar Grove (Wis.) Stove Company. The range is small in size and equipped with two ovens, one for cooking and another for broiling and roasting. A small water heater is attached which heats enough water for coffee or tea without the use of additional current.

New Catalogs

Benjamin Electric Mfg. Co., Chicago, has published a booklet entitled "Points on Productive Lighting for Industry" which gives information about industrial lighting in general, about Benjamin products, with tables of recommended lighting intensities in various industries.

Crouse Hinds Co., Syracuse, has issued two new bulletins on floodlighting, Nos. 2106 and 2109. The former covers floodlight projects and industrial units; the latter shows methods of floodlighting public buildings, aviation fields, and commercial plants.

The Lincoln Electric Co., Cleveland, Ohio, has issued a catalog of "Linc-Weld" motors which gives in detail the construction of the motors, the special welding process, and special motors.

Benjamin Electric Mfg. Co., Chicago, announces a new bulletin on panelboards featuring an arrangement for individual control of branch circuits when so desired. Additional space is provided in trim at bottom of panel for installation of tumbler switches.

Manufacturers Notes

Graybar Electric Co. announces the following changes: J. A. Mayer has been appointed Oklahoma manager with office in Oklahoma City; R. W. Conrad has been appointed sales manager at Tulsa.

Wadsworth Electric Mfg. Co., Inc., Covington, Ky., has announced that Roy Cosbey has been elected director and secretary to fill the vacancy created by the death of Richard J. Dibowski.

Roller-Smith Co., New York, announce the following changes: Albert Milmow, Latonia Bldg., Charlotte, N. C., is now exclusive agent for North and South Carolina; M. B. Mathley, Monadnock Bldg., Chicago, Ill., exclusive agent for the Chicago territory; W. J. Schuhmann, sales engineer in the New York office, has been transferred to Bethlehem, Pa.

Wagner Electric Corp. has opened a sales office at 1006 Washington Avenue, Houston, Tex., under the direction of W. B. Arbuckle.

Ideal Commutator Dresser Co., Sycamore, Ill., has opened a sales office at 182 Purchase St., Boston. New sales representatives have been appointed as follows: C. B. Keck, 1565 Rydalmount Rd., Cleveland Heights, Ohio; F. D. Lawrence Electric Co., Cincinnati, Ohio; O. T. Hall, 432 North Calvert St., Baltimore, Md.; G. A. Brewer, New Haven, Conn.; and DeMoss-Fox & Co., 320 Beaubien St., Detroit, Mich.

The consolidation of Jefferson Electric Mfg. Co., and the Chicago Fuse Mfg. Co., both of Chicago, has just been announced. The new organization is known as Chicago-Jefferson Fuse and Electric Co., and its offices are at Laflin and 15th Sts., Chicago. The new company sells through jobbers. The following are officers of the new organization: J. A. Bennan, president; A. R. Johnson, vice president; A. E. Tregenza, vice president; and J. C. Daley, treasurer.